THE physical therapy REVIEW

Volume 31 - Number 11 November 1951

The Challenge of the Scientific Method — HOUTZ

Some Psychiatric Aspects in a Physical Therapy Program — BLASKO

The Stabilizer, An Assistive Device for Shoulder Stabilization and Exercise — ZADROZNY

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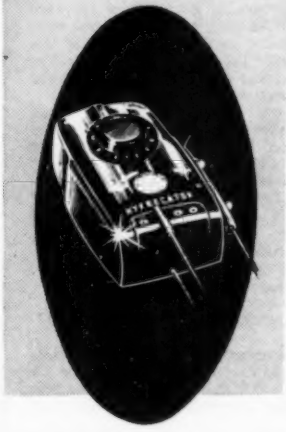

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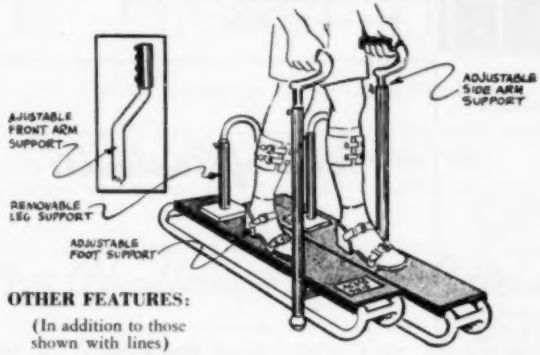

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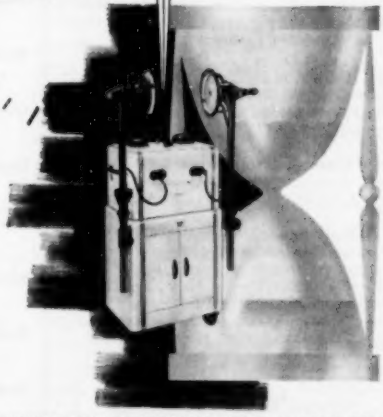

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The Physical Therapy Review

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Volume 31 **November 1951** **Number 11**

The Challenge of the Scientific Method

Its Implications for the Physical Therapist

Sara Jane Houtz, M.S.

The term scientific method has as its connotation the investigation of a problem by the application of a specific mode of procedure, and the interpretation of the results thus gained in terms of current knowledge. The method may be applied to the analysis of clinical findings, the evaluation of newly developed devices, or controlled laboratory experiments. The physical therapy profession is approaching the adulthood of its career. This is evident by its increasing interest in the scientific method and in the research opportunities offered the physical therapist. Thus, two questions pertinent to the times are forthcoming: what are the potentialities of the physical therapist in the field of research, and what are the potentialities of research in the field of physical therapy?

The possibilities of the physical therapist as a research person depend primarily on the capabilities of the individual. Osler illustrates this point in the following story.

> The question came up one day, when discussing the grooves left on the nails after fever, how long it took for the nail to grow out, from the root to edge. A majority of the class had no further interest; a few looked it up in books; two men marked their nails at the root with nitrate of silver, and a few months later had positive knowledge on the subject.

It is obvious that the last two students had the curiosity, imaginative insight, and earnest endeavor to investigate a simple problem by the scientific method.

A physical therapist may increase his usefulness, both to the profession and the doctor, if he has curiosity associated with the desire to add to human knowledge. In "Clinical Research with a Notebook," Alvarez stresses the contributions that can be made by the curious physician who continually asks questions, endeavors to find the answers, keeps accurate notes, and presents his findings periodically in a clear and concise report. This chapter is applicable also to the physical therapist interested in clinical investigation. He too can acquire the habit of carrying a notebook for the purpose of recording observational details and questions to be answered later, either by integration with what is already known, review of the literature, or experimental research. It is important to close a section of the notebook periodically by tabulating the memoranda and coming to a decision regarding the findings.

Imaginative insight is an innate quality essential for the pursuit of a career in research. The ability to create the object or formulate mentally the idea not present is basic to investigative work. Those who have had an opportunity to review the literature for an organized laboratory research realize there is relatively little that has not previously been described. The expression "nothing

Division of Clinical Research, Baruch Center of Physical Medicine and Rehabilitation, Medical College of Virginia, Richmond, Va.

new under the sun" is trite but true. What is new and different about the investigation, however, is the *frame of reference*. For instance, men have known for decades that systematic training against heavier and heavier loads will rapidly augment muscle size and strength. Knowing this, DeLorme through his imaginative insight formulated and built a similar program applicable to patients suffering from orthopedic disabilities. Thus "weight lifting" became "progressive resistive exercise." Somewhat similarly, cross education was investigated extensively some fifty-odd years ago by the psychologist. Hellebrandt et al. found muscle strength in the contralateral extremity augmented by progressive resistive exercise of the ipsilateral limb. This phenomena was then interpreted in the light of existing knowledge in the basic sciences. In both cases, the known was applied to a new *frame of reference* through the operation of imaginative insight.

Finally, the individual desiring a research career must have an indefatigable capacity for work. Much investigation has proceeded after clinic or school hours. Often the results of the day's experiment are computed far into the night or before the working day begins the following morning. While long hours are not necessarily desirable, the insatiable curiosity within the investigator frequently demands that he answer the question immediately. Thus character qualities of curiosity, imaginative insight, and earnest endeavor control to a very large extent whether or not the physical therapist accepts the challenge of the scientific method and recognizes opportunities within his grasp.

What are the possibilities in the field of research for the physical therapist? Two roads are open, either the individual may be an independent investigator, or he may operate as a member of a team. The former is attained by few and only after advanced study and intensive training under the guidance of an able scientist. Development as a research person functioning as a member of a team depends on two things, the capacities of the individual and the opportunities offered for growth.

Individuals who have participated in organized laboratory experiments will never forget the feeling of the team spirit derived from the oneness of purpose. Each member of the team holds the pulse of the experiment in his hand. First there is the scrupulous planning of the experiment; the delimiting of the problem, laying out of the procedure, setting up and checking the necessary equipment, and assigning of appropriate tasks. Then follows the experiment. The equipment is rechecked, the subject is placed in readiness, and each member of the team is at his designated station waiting for the quiet signal, "When the second hand passes the 60-second mark the experiment will begin." Thereafter, there is no individual, only the team. Finally, the same quiet voice says, "The next reading will be the last," and later maybe, "That was a good experiment." Then come the clean-up activities, the computation of data, and the interpretation of the results of the day's experiment. One is reminded of Kipling's quotation.

> It ain't the individual
> Or the army as a whole,
> But the everlasting teamwork
> Of every blooming soul.

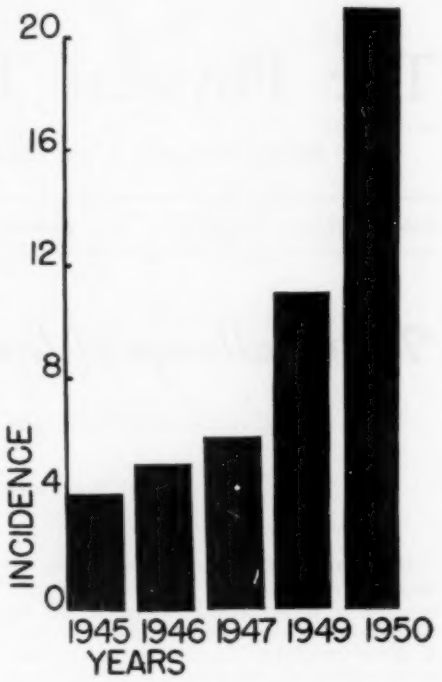

Figure 1. Column diagram showing the recent increase in the number of Registered Physical Therapists listed as author or co-author of papers abstracted in the "Year Book of Physical Medicine" and the "Year Book of Physical Medicine and Rehabilitation."

The individual responsible for the direction of a laboratory is important for the development of a research person. In reading the history of physiology, one is impressed by the profound and lasting effect of the concepts of the teacher. Thus, one should choose a teacher wisely, forgetting not the importance of individual thinking and study.

In recent years, graduate degrees requiring an original piece of work and the preparation of a thesis have given increasing numbers of physical therapists the opportunity and desire to advance their profession. It is noteworthy to observe in Hewitt's report, that 75.5 per cent of the graduate students responding to her questionnaire thought a thesis important to a master's degree. A thesis affords the physical therapist an opportunity to do creative work under supervision, an experience many would enjoy. While most theses may not justify publication, Pitkin stresses that one learns to write by writing. Beardsley goes so far as to say that effective thinking and accurate writing are interrelated. The investigative experience offered by the advanced degree is usually only the initiation of the individual into the way of the scientific method.

Physical medicine has grown at an unbelievably rapid rate during the past decade. Physical therapy has progressed likewise, particularly in education and speciality technics. Is the physical therapist ready and competent to accept the exacting demands of either the research physiatrist or the scientist working in allied fields? By a survey of the past, future opportunities for the physical therapist in research may be predicted. The ultimate purpose of all research is the advancement of knowledge. This implies its dissemination, which is usually done through publication. One of the objectives of this paper was to survey the current physical medicine literature of the past five years to determine the trends of the contributions by physical therapists, either as authors or co-authors of published papers. Such names as Brown, Brunnstrom, and Feucht Randall appear repeatedly. Increasing numbers of physical therapists are now working on research teams which are contributing fundamental knowledge to the field of physical medicine. Figure 1 illustrates the Registered Physical Therapists who were authors or co-authors of papers abstracted in the *Year Book of Physical Medicine and Rehabilitation* for 1945, 1946, 1947, 1949 and 1950. Represented in figure 2 are the number of Registered Physical Therapists whose names appear on papers published or abstracted in *The Physical Therapy Review* and the *Archives of Physical Medicine* during the last five years. It is interesting to note that there was a significant increase in publications by physical therapists following the change of the *Review* from a quarterly to monthly periodical in 1949. The members of the physical therapy profession should be proud of the direction in which they are progressing. It is imperative, however, that the publications be of a caliber which brings credit to the profession. Quantity is soon forgotten; quality remains immortal.

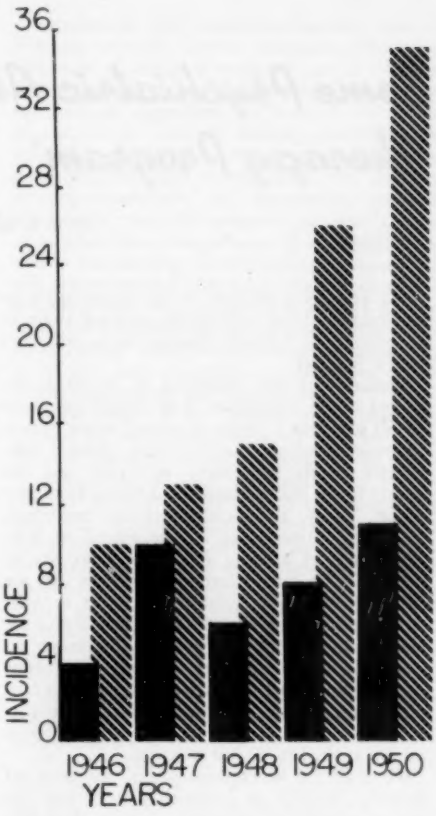

Figure 2. Increase in the incidence of contributions made by Registered Physical Therapists to the "Archives of Physical Medicine" (solid columns) and "The Physical Therapy Review" (cross-hatched columns).

Thanks are due Dr. F. A. Hellebrandt for the constructive criticism offered during the preparation of this manuscript.

(For Bibliography, see page 483)

Some Psychiatric Aspects in a Physical Therapy Program*

John J. Blasko, M.D.

The principles outlined in this paper apply to the treatment of all sick people, and not alone to the practice of physical therapy in a neuropsychiatric hospital.

Normality is not something to be taken for granted in our civilization, even though our legal friends state that a person is normal unless proven otherwise. Everyone has to make positive constructive efforts to achieve normality, and we mustn't forget that normality is different from perfection. Today, all so-called nervous, emotional, and mental disturbances are considered an individual's way of meeting difficulties in his way of life. There are certain forces in the body that are always attempting to balance each other in what we call homeostatic equilibrium. These forces are continuously shifting and dynamic. To insure organic growth it is necessary that they be dynamic and adaptable. That is why we must take into consideration not only the constitutional inheritance of an individual but all of the external forces that are applied to his life situation.

We shall try to explain simply, the cause of abnormal feelings or behavior that persists too long or appears in situations where it shouldn't. There are certain physiologic or normal tensions, drives, forces, power, needs, energy, or any other word we wish to use, that require expression. These needs or tensions have to be resolved or gratified in some manner. In order to adapt one's self to one's environment in resolving or modifying such needs, certain protective reaction patterns, or as they are sometimes called, mental mechanisms or dynamisms must be employed. In doing this, personality is formed; also, a fairly rigid set of behavior patterns evolves. Thus, something once experienced is never really forgotten. In the mature, stable individual, earlier patterns of behavior are modified; while unstable, immature individuals remain children emotionally. Thus, it is readily seen that personality is repetition, and that the potentiality of reverting to childhood behavior in situations of stress is present in all of us.

The study of these various processes is essentially what is incorporated in the term "psychiatry." In very simple, practical language this means that anyone subjected to frustration or emotional stress that is strong enough and persists long enough will develop neuropsychiatric symptoms. This is the reason psychiatrists dealing with adult individuals are so interested in the patterns of behavior set down in infancy and childhood. The circumstances that are in effect during the early years of an individual's life are probably the most important in determining personality development. These include all the influences that act on him—the influence of members of the family, friends, religion, schooling, physical illness, and everything with which he comes into contact and experiences. Some of these influences start at birth; some at various points along the way. But all of them play a part in molding personality; that is, the manner in which a person reacts to the things that happen to him. These influences determine how a person behaves. If he thinks and behaves in the way people around him find acceptable, and if he himself is reasonably comfortable and satisfied, he is considered normal, well-adjusted, sane. If his behavior is too far out of line, too different from others, and he is unhappy within himself, he is considered queer, neurotic, maladjusted, insane, or psychotic, depending on how different or extreme is his behavior.

Some of us will channel the excessive emotions into the body, as we did when we were infants and children, and be unconscious of the fact that our headaches, body aches, eye trouble, stomach trouble, high blood pressure, asthma, heart trouble, and so on, are symptoms of our ways of meeting life. Some of us may withdraw from situations, build shells around ourselves, and even start to hear voices that are not real. Some of us may get

Director of Professional Education, Veterans Administration Hospital, Gulfport, Mississippi; Clinical Assistant Professor of Neuropsychiatry, Louisiana State University School of Medicine.

*Read before the Annual Conference of the American Physical Therapy Association, Glenwood Springs, Colorado, June 1951.

depressed and attempt suicide. Others may express the fighting reaction using aggressiveness, irritability, and assault, having paranoid ideas and the feeling that it is other people's fault. Delinquencies may result, and crimes may be committed.

It will never be possible to prescribe specifically definitive therapy based on our present-day system of psychiatric nomenclature. The labels used in psychiatry do not have the same basis or validity as those used in pathology. We should emphasize the reactions of patients and not the diagnostic label.

In every hospital and clinic patients are seen whose complaints are troublesome and chronic, whose diagnoses are often in doubt, and whose treatment is less than satisfactory. In dealing with these patients the physical therapist must make a major intellectual adjustment by putting the emotional life of the patient on a biological plane with the organic and physiological data that are familiar. He must learn to think of hostility and resentment as something just as real and just as important to the clinical picture as a paralyzed extremity. He must realize that the emotional life has coherence and continuity, that its growth and development parallel physical growth and development, that it is subject to trauma and degeneration, and, like the behavior of the heart rate, is governed by the principle of homeostasis.

At the beginning of any therapy, one should not be too concerned whether the patient has a mild depression, a neurosis, a psychosomatic situation, or a mild psychosis. We are interested in knowing what kind of an individual he is. Each patient is best understood on a rather simple basis; that his neuropsychiatric illness represents his way of dealing with anxiety, his defense against the discomfort of anxiety, or his translation of anxiety into a different area.

Anxiety may be mediated directly through organs, which is best seen in psychosomatic disturbances. The anxiety is mediated through the autonomic nervous system and translated into functional disorders of organs or their parts. Emotions, in this broad sense, can be etiological in these conditions, and can explain the fluctuations in the degree of symptoms that have much to do with the course and outcome of organic dysfunctions; they may spell the difference between acuteness and chronicity in these conditions. We also know that certain physiological processes, once set off on the wrong functioning path by overwhelming anxiety, sometimes become irreversible and can no longer be turned back into normal channels.

In the field of physical therapy, as well as psychiatry, there appears to be evidence of growing dissatisfaction with existing programs, and of attempts to study current programs critically to determine if change is necessary and, if so, what changes should be made. What the student does not have an opportunity to learn is the nature of man in its broadest meaning, including the student's relationship to the society in which he lives. Much has been written about love, affection, security, satisfaction, and dependency, yet such abstractions cannot be translated into words. Most of us admit the incompleteness of knowledge relative to the teaching of such concepts to students, and realize that the knowledge which does exist is possessed by a remarkably small number of persons. Just think how ridiculous it would be to use an exclusively didactic approach in communicating to students such intangibles as resentment of authority, dishonesty, and unreliability.

Today there is an unprecedented eagerness, perhaps an anxious eagerness, on the part of all physical therapists to learn more about the nature of themselves and their relationships to the society in which they live and to the people that they treat. A small number betray their anxiety by an almost childish demand for formulae and for fixed designs for living. Most of us are acquainted with the method of teaching wherein the subject matter being learned is put down in 1-2-3 order with capital A's and small a's denoting subparagraphs. Our society puts a high value on orderliness and many feel that learning is easier by this method, but man cannot be discovered in this fashion. There are no stock formulae or set designs for living.

The most difficult part of this discussion is one about which least is known. What does the therapy being applied mean to the patient? It is true that the meaning may depend not only upon the patient's mental content at that particular time, but the manner of application and the attitude of the therapist will also help to determine the particular meaning of any therapy to a patient.

We may know quite a lot about the physiological effects of various physical therapies, but the psychological meanings are equally important. This is an area that requires much more research and study than has been given to it. The specificity of prescriptions in the application of physical therapy to alter behavior patterns is nebulous and generalized, and, at the present time, limited to formulations concerning the understanding of attitudes within ourselves and the patient. Of course, a great deal has been written about various types of therapeutic modalities that can be utilized to stimulate apathetic and depressed patients, and also about the types of modalities to be used as

relaxing and sedative measures in the hyperactive and aggressive patients.

Physical-psychological parallelisms are expressed, for example, in the reaction of the patient to therapeutic modalities applied to the periphery of the body as contrasted with the more important parts of the body—more important, that is, to us or to the patient. For example, massage of the forearm will produce different and less intense reactions psychologically than massage of the lower abdomen. The skin on our face is more important to us and will give us different reactions when affected than the skin on our ankles. The value that civilization puts on beauty in our culture is tremendous and will influence our reactions to anything done to this valuable part.

The older and wiser physical therapists recognize these factors in their profession when they admonish others to massage gently at first, objectively, and start at the periphery. This is not based solely on physiological principles.

We can get so used to working with glittering, mysterious equipment that we lose sight of the fact that our patients may have many fears, doubts, and misconceptions regarding these magic devices. Even the wet sheets used in hydrotherapy may be fitted into the patient's mental content, and thus be regarded symbolically. I remember one patient who eagerly sought wet sheet packs because he felt he was being wrapped in fondling clothes. Many patients will feel more secure and protected because of the confinement, symbolizing regression to babyhood and being cared for. (Many mothers use what are practically dry sheet packs to make sure their babies do not get the covers off.) Others react with hostility to the same therapy and therapist, and to the dependency situation, not only because of the obvious hostile component in their illness, but also because they believe confinement limits their freedom and exposes them to potential danger while they are helpless to defend themselves. Many other meanings are present as far as the patient is concerned. If each therapeutic procedure in each patient was studied in this manner, it wouldn't be too long before we would have some facts.

The continuous tub may symbolize drowning to the patient. To the depressed, water may mean washing away of their sins. A patient, attempting to drink up all the water in the tub, is expressing his oral traits, or if he is urinating or defecating in the tub, he is showing regressive features associated with bowel and urinary function. All of these things are helpful in understanding the behavior of the patient and the meaning of the treatment to him. Sprays, ultraviolet or infra-red lamps may mean poison rays or some danger associated with the stinging of the skin. Of course, the patient will react according to the nature of the difficulties present within him; the meaning of the therapy will be fitted into these difficulties. Regression to dependent needs is seen in the bathing of infants, or the washing of infants symbolized by massage. It is only natural therefore that female physical therapists have less trouble with both male and female patients; for it is a rare father, in our culture, who bathes the infant.

It is easily seen that every attempt must be made to give a clear explanation of what is going to be done to the patient. With some very severe psychotic patients the physical therapist must learn the more intricate technics of non-verbal communication in order to influence favorably the patients' attitudes. He can do this through his own attitudes and manner of applying physical therapy.

The severely ill psychotic patient often utilizes concepts of electricity in his delusional system, and it is easy to understand why he becomes disturbed by the application of any electrical treatment. This simply confirms his suspicions that now his enemies are out in the open with their tortures and persecutions. (We would react this way in his situation.)

The area of sexuality in most psychotics is always affected, so that the mere matter of the gender of the therapist must be evaluated, especially if some bodily contact, as in massage, is utilized in the therapy. All sorts of sexual conflicts may be reactivated or released. We know that as a general rule the individual with homoerotic conflicts or strong aggressive features will usually get along better with a physical therapist of the opposite sex. These particular dangers will exist especially in genitourinary, obstetric, and gynecological work, and often fit right into the patient's disguise.

These types of generalizations just made have to be reinforced by specific knowledge of the individual's conflicts, delusions, and behavior patterns. This requires close integration between the psychiatrist and the physical therapist.

The physical therapist's reactions to obscene, vulgar, or aggressive language or behavior will often interfere with the therapy of neuropsychiatric patients. The case cited by a physical therapist is a good example. The patient kicked and swore at any human who approached him. He did this in order to retain his feeling of hopelessness, and the feeling that no one was interested in him. If he had cooperated he would have become uncertain of his delusional system; however, through patience, tolerance, friendliness, interest, and sin-

cerity, his cooperation was won. He gradually acquired new beliefs and attitudes which enabled him to resume living outside of the hospital, and I feel that physical therapy had a great deal to do with his recovery.

The therapist's personal life experiences and his training will determine to a considerable degree his ability to deal with the patient's attitudes and feelings, which, I pointed out, are formed early. Dealing with prejudices, biases, sentimental identifications, over-evaluations, and hostility within one's self is quite a problem. These make for insecurity and unhappiness, and unfortunately, the principles of two and two making four can not be applied in trying to understand them. We must be able to deal with these things without mobilizing unduly our own anxiety, which obviously impairs our ability to treat the patient. The physical therapist should be acquainted with basic knowledge about important needs, frustrations, gratifications, and adaptive devices peculiar to infancy, childhood, and adolescence. He should learn that emotional and social factors play an important role in the causation of disturbed physiology and maladaptation.

In treating sick people we must realize that they are usually somewhat frightened about the threat that their illness involves. As a therapist you will represent support and authority, but because of their illness and troubled feelings, patients will frequently have difficulty in cooperating. This happens with all patients, and not neuropsychiatric patients alone.

The attitude of the therapist is the most important thing in this therapeutic relationship, and it must generate confidence and understanding. At all times you must stress the idea, "I'm for you; I'm for you in your trouble." This must be demonstrated wholly by attitude and must never be put into words because it is sure to sound patronizing. You must give of yourself to the patient. The majority of sick patients are like children and will regress to childish dependence upon you. This is what is meant by the patient-therapist relationship. All therapists should be aware of the effectiveness that is possible when the situation is created intuitively and naturally. It is a special situation in which the patient feels that he is understood, that you are confident of what you are doing, that you have only his interest at heart, that you really pay attention to everything he says and does in his reaction to the therapy you are administering. This objective can be achieved only by creating a sensitive, understanding atmosphere which permits the patient to recognize that you are sincerely interested in him as a person and in helping him to get well. At the same time you must keep your own emotional reactions toward the patient as much in the background as is humanly possible.

The physical intimacy of many of the therapeutic modalities you will administer, and the dependence of the patient on you as a therapist while it is going on, are extremely important in the patient-therapist relationship. In this situation you must have the capacity to deal with other people's anxieties without becoming bored, sentimental, punitive, or moralistic, and without identifying blindly with the patient's problems. Your facial expression is often very important because patients watch it while you administer the treatment or while they talk, and they will feel some security if it is composed, confident, attentive, and understanding. Your face is a magnifying reflector and must be carefully guarded in the therapeutic relationship.

Speech is not only a means of communication but also a means of disguising and camouflaging emotions, so that you should note not only what the person says but how he says it. The patient, speaking about his mother's death with tears in his eyes, presents important evidence to you about his total personality; this is just as important as whether the chronic ulcer edge is showing signs of granulation. The patient blushing in the middle of the administration of some physical therapy may indicate an important emotional facet. Asking to go to the toilet, or displaying an increased motor discharge with a great deal of fumbling with clothing or twisting or turning, or putting his hands through his hair—all of these are significant and indicate an over-discharge of emotional tensions, which may or may not be provoked by the things that the patient may be talking about at the time, or the things you are doing to the patient at that time.

In this patient-therapist relationship we have a reality factor. This means that people come to us, or are referred to us, because they are sick and because we are trained and experienced therapists who have the knowledge and skill to help them. There is also a symbolic relationship in which the patient comes to us with much fear and trembling, while others keep away because they feel that in some magic way they do not have the illness they fear, as long as someone doesn't tell them so. The first words you say to a patient often may determine the type of relationship that develops. Some patients will respond to an authoritative approach; others want sympathy; others want to get certain things that they can't get at home. You may take

the place of a good father, and the patient may resent this authority. You may take the place of a threatening mother, and the identification of the attitude of the patient toward you may be found in his not taking your recommendations seriously.

Most of the time we see only the positive aspects of the patient-therapist relationship. The negative aspect is there, but all of us like to be liked. We like to be told, either directly or in a subtle way, that we are good therapists; that we know what it's all about; to be told "that treatment made me feel better than I've ever felt in my life." It is hard for us not to take some subtle near-conscious delight in being told how bad some other therapist or therapy is, and that he misunderstood completely what the problem was. Frequently all of this may be true. But despite this, human beings always have a slight tendency to overvalue themselves. The patient is more likely to take advice and to accept suggestions on the basis of a positive relationship. When the patient develops negative attitudes toward us, we tend to take them even more personally than the positive attitudes. In other words, the patient, attempting to over-value us, is very likely to make us believe that perhaps we are not quite that good, or our therapeutic modalities are not quite that good, but pretty nearly as good as that.

When a patient is hostile toward us we are sure that he doesn't know very much, especially, that he doesn't know what he is talking about. In such cases we feel there is something wrong with the patient—he is not a good patient—and we can't do anything for him because we ourselves can't tolerate hostility. This is the time when the cooperation of the psychiatrist is needed. In searching for the basis of hostile reactions you will find that the patient is merely repeating his previous patterns of behavior. Whenever you see reactions that are too positive or too negative, look for the patient's earlier relationships, or find out from the psychiatrist. This will also help as a kind of safety valve for your own self-respect and ego. Positive feelings are not hard to handle. When it comes to negative aspects most of us become a little hot under the collar, whether we recognize it or not, and we try to get rid of that particular patient.

Most therapists don't like to hear anything that reflects upon their professional dignity. But if you show this too obviously, you are certainly going to lose a lot of patients or else a lot of patients won't get well. The real reason that patients often lose their symptoms is because they have secured in their relationship something that they have unconsciously wanted. The symptoms may have been caused by lack of sympathy and understanding, and when these were gained the symptoms disappeared. For various reasons a neurotic can't get what he wants, therefore his symptoms are a compromise. If the neurotic develops a positive relationship to the therapist and gets the protection, security, sympathy, understanding, magic, or whatever it is he wants, he no longer needs his symptoms and gives them up. If he develops a hostile attitude toward us he has gotten around us by a very simple maneuver, and all he has to do is retain the symptoms and prove that we and our therapeutic modalities are no good as far as he is concerned.

Although positive feelings are easier for most of us to accept, they sometimes cause difficulties because of the demands that a patient will make. It is easy to become angry or upset because these patients spend so much time and effort in pestering you. You should know how to handle this. Some of us have only good patients; we are such nice people that nobody can dislike us. But this is valuable only to a certain point.

One thing about this patient-therapist relationship is that it should become part of your automatic thinking; otherwise, you might get into trouble. Don't say to yourself, next time you treat a patient, "I wonder what this patient thinks of me. Does he like me or not?" because this is like riding a bicycle and thinking each time whether you put your foot here or there—this won't get you anywhere.

A word or two about patients who go from one hospital or clinic to another, and who shop around from one therapist to another comparing notes. We can say that these patients haven't been satisfied, and it is sad to say but sometimes we can't satisfy them. These patients may shop around from one pseudoscientific or pseudoprofessional cult to another. Why do they do this? Some of them are pretty intelligent people, too. It is not only because some of them are superstitious or psychotic; it is because somewhere along the line medicine can't give them what they want. The fact that patients can't get from the therapist what they need —and I'm not talking in terms of kinds of prescriptions, medicine, or physical therapy procedure, but in terms of inner feelings, sympathy, understanding—this is the real reason why they go from one place to another seeking help.

Some therapists can tolerate positive feelings only to a certain point and then it becomes dangerous for them in one way or another. The therapist may feel shameful, embarrassed, or guilty, letting these emotions become so strong that they alienate the patient. Most therapists are afraid of

becoming implicated or involved; they picture themselves as robots of some kind. Actually, this is a pseudoprofessional attitude which can develop very easily. Of course, we cannot become sentimental or tearful and we cannot allow ourselves to become so involved that our own emotions will affect our judgment. We mustn't take sides with the patient, and we mustn't reflect the patient's own attitudes, because there is no surer way of getting ourselves into trouble.

If there is a real clash in personality every time you treat a patient, especially a neurotic, and this happens too often, then there is something the matter with you. It is true that for one reason or another there are patients that we just can't handle, but if it keeps on happening, one patient after another, then the therapist should do something about it.

To sum it all up as far as the patient-therapist relationship is concerned—if all of our patients love us, then it is time we stopped and asked why. If all of our patients hate us, we should also ask why. If we hate all of our patients, the same thing is true. In other words, we can't have everything going in one direction without something being wrong.

The time has passed for the jealous guarding or narrow barricading of any clique. The treatment of neuropsychiatric patients requires the skill, strength, and patience of everyone working with problems of human behavior. A realistic view has to be taken as to the proper functions of various professional groups, and for the sake of honesty and ethics, the proper role of each person should be carefully outlined. In treating behavior and ideational problems, responsibility frequently cuts across professional lines and must be based on the solid foundation of training, experience, and ability. Thus, one cannot get away from the team concept in dealing with neuropsychiatric disorders. The sooner the team works as a team, the sooner the patient will benefit.

The Stabilizer, An Assistive Device for Shoulder Stabilization and Exercise

Lucian J. Zadrozny, B.S.

Effective stabilization has always been of prime importance in muscle exercise and in cases where stretching is indicated. Active stretching, as performed by the patient during a particular exercise, can be utilized to maximum advantage providing such stabilization is available. Otherwise, much time and effort are wasted. For example: patients with certain shoulder disabilities, including contractures, sometimes spend weeks, perhaps longer, exercising and using a shoulder wheel or wall abduction board with no apparent increase in range of motion. The fault does not lie in the use of such apparatus, because under proper conditions they are excellent. The fault lies in the lack of proper stabilization during such activity. However, it is often difficult for the physical therapist to provide all the necessary stabilization. That is why, after a patient has been properly oriented in definitive exercise, various splints and devices are often used to supplement regular therapy, enabling the patient to spend more time exercising by himself and freeing the physical therapist for other duties.

An effective stabilizing device is especially valuable in the case of shoulder or shoulder girdle weaknesses, as mentioned above. In the case of a very weak serratus anterior, such a device could

Staff Physical Therapist, U. S. Naval Hospital, St. Albans, L. I., New York.

limit the usually resultant "winging" of the scapula. Such a case is quite simple, however.

Unfortunately, muscle weakness is often complicated by other factors. It is assumed that, under normal conditions, a joint motion is generally made possible by a functioning harmony between the prime movers and their immediate stabilizers and between the agonist and antagonist muscles. Any impairment of such interrelationship will very likely result in a certain degree of dysfunction which may manifest itself in altered muscle action and joint motion pattern. Imbalance in muscle strength would eventually give rise to contractures and invite substitution. Effective exercise under such adverse conditions would then become a problem of reeducation and proper stabilization.

In view of these factors, it becomes obvious that, when a certain motion such as shoulder abduction is desired, a great many things must be considered. For example, when the paticnt is exercising his deltoid in abduction, does he substitute with his upper trapezius, "hike" his shoulder, and flex his trunk laterally in order to raise his arm? Does he arch his back? Does most of the motion take place in the glenohumeral joint? Or, is there a great deal of accessory motion with the scapula "winging" or rotating itself abnormally each time the arm is raised? Are the pectoral muscles very tight?

Assuming that a patient was faced with all of the above problems, it would, as mentioned before, be quite difficult for a physical therapist to provide effective stabilization at so many different places simultaneously. That is why an assistive device such as the "Stabilizer" could be used to great advantage. It not only provides the necessary stabilization, but also limits substitution and localizes the site of muscle exercise in the deltoid region, as desired. At the same time that the patient is exercising his deltoid, a certain amount of active stretching of the pectorals is made possible

The chief mechanical features of the device along with their related rationale and principles of application are as follows: As shown in illustration *(See Figure 1.)* the "Stabilizer" is made up of contour-moulded semi-flexible plastic plates

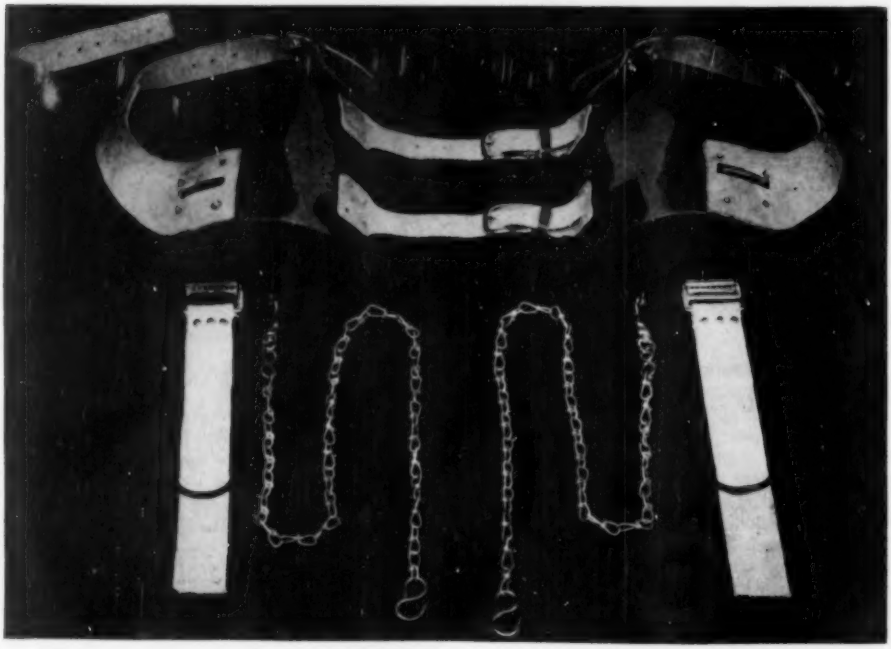

Figure 1.

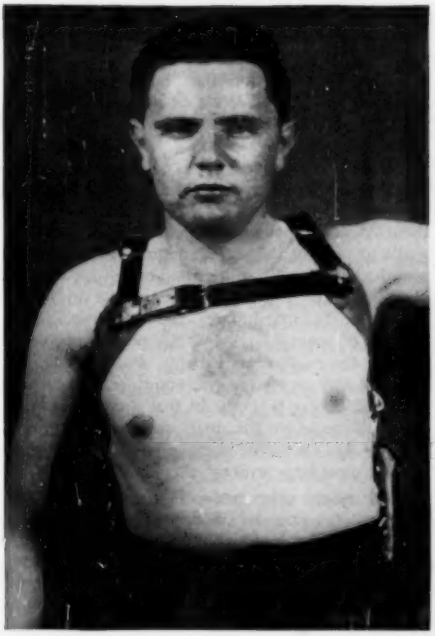

Figure 2.

and leather harness. Other parts include canvas belts and non-slip buckles, chains, and swivel-clips. One of the important features is the relatively high location of the chest strap. Such placement eliminates the discomfort and binding effects one would have with a strap placed directly across the chest. There is little or no interference with normal chest expansion. *(See Figure 2.)*

Another very important feature is the inclusion of a means for "anchoring" or depressing the shoulders, thereby limiting substitution of the upper trapezius along with the characteristic "hiking" of the shoulder during abduction. This function is accomplished by chains and adjustable canvas belts which fit through slits in the plastic plates. The chains are "anchored" to a chair. *(See Figure 3.)* A chair having a back support is preferred because, if the patient is properly seated, arching of the back is, for the most part, eliminated. Final small adjustments can be made by loosening or tightening the canvas belts. With the combined support of the "plates" and leather straps, localization or concentration of exercise in the deltoids becomes possible. Instead of the already normal upper trapezius doing so much work and becoming stronger while the weaker deltoid

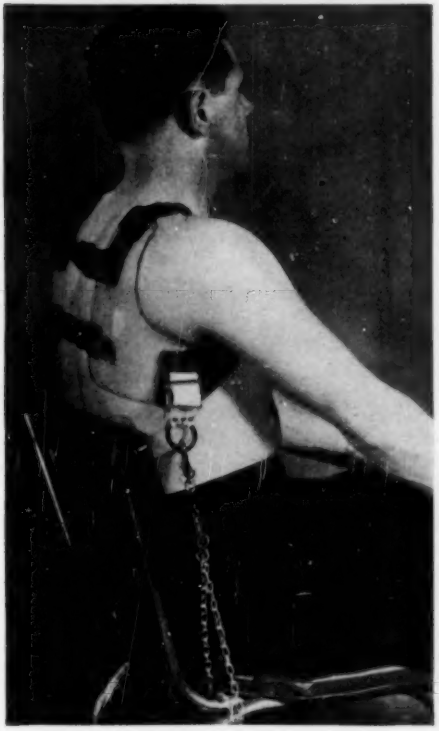

Figure 3.

remains the same, the situation is reversed. Motion is restricted primarily to the glenohumeral joint, and the deltoid is given an opportunity to exert maximum effort without interference from the upper trapezius. In this way, muscle fibers which had not been used fully before will, of necessity, be called upon to contract, and gradually become strengthened.

It is a known fact that there is a direct relationship between the strength of shoulder depressors and the degree of shoulder abduction attainable.

Figure 4.

Where the shoulder depressors are normal in strength, a greater degree of abduction can be reached than in a case where the depressors are weakened. For this reason it is believed that the "Stabilizer" may be helpful, although further evidence is needed to substantiate this hypothesis. At the moment it is merely speculative.

On the positive side, the "Stabilizer" has been found to be quite effective in limiting "winging" of the scapula as found in cases of weak serratus anterior muscles *(See Figure 4.)*. The plastic plates are moderately curved and contoured in such a manner as to conform to the shape of the back and, for the most part, to "contain" the scapulae within them. A large portion of plate passes under the axilla to prevent the scapula from protruding. The semiflexibility of the plastic allows for a little "bend" in the plates to accommodate individual shoulders. The "Stabilizer" shown in the illustrations is of average size and has been found to be suitable for most adult patients, male and female. A small and very large size could be made where indicated. There is no doubt that there would be a greater demand for the small size than for the very large, inasmuch as the average size can be used to include most large individuals.

Some of the other possibilities which are being explored in using the "Stabilizer" are wall-pulley work, shoulder abduction using wall finger-boards for stretching of pectorals and/or teres, infraspinatus, and latissimus muscles, and in certain cases to assist quadriplegic patients during crutch-ambulation.

NOTE:

It is assumed that the supraspinatus muscle is included wherever the upper trapezius is mentioned. It has been omitted as a matter of convenience to avoid constant repetition.

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The Rehabilitation of Aphasics*

Dorothy Britton, M.A.

A human being can be deprived of his normal ability to use or understand language in its various forms of speech, reading, and writing by disease or injury which damages or isolates certain areas of the brain. When such interruption of cerebral function results in language disabilities without marked change in the general intelligence of the individual, the many kinds and degrees of loss of speech and understanding are grouped under the generic heading "aphasia."

In much of the earlier literature on aphasia, cases were described which gave evidence of certain localizations of language function centers within the brain, but as soon as a theory was proposed exceptions would appear. Therefore, the symptoms and etiology of aphasia have been the subject of many scientific books and articles and the cause of many debates in medical history. Understanding of the anatomy and physiology of the human brain is not yet complete and there are still controversies and unproven theories about the etiology of some of the aphasic manifestations. However, it is generally accepted that certain localized, roughly defined areas of the brain are essential to normal performance of specific behavior patterns but that no one area can function independently. For instance, Broca's area, the portion of the cortex which controls the movements of the organs of articulation, is located in the third frontal convolution. The area essential for understanding of speech is Wernicke's area in the first temporal convolution. Visual recognition and interpretation of written and printed language are the functions of areas in the parietal and occipital lobes. All of these centers and many others are interconnected by association fibers and act in close coordination for normal use and understanding of language. It is obvious, therefore, that a large part of the cortex is involved in the interpretation, formulation, and production of language and that damage to any area or disruption of the complex association pathways may result in defective performance of intact areas. In other words, a patient who presents symptoms of aphasia in his speech almost invariably shows some impairment of reading, writing, or understanding. The disturbance is usually more severe in one performance than in another but it is safe to say that aphasia resulting from a cerebral lesion is rarely, if ever, confined to a single language function.

Cerebral lesions are not restricted to the centers concerned with language. They may cause the loss of the voluntary control of any type of activity of the organism. A diffuse lesion may reduce all cerebral activity to a state where rehabilitation is impossible or, at most, extremely limited. Lesions of the control centers for body movements or sensations may cause paralysis or loss of sensation in parts of the body. A right hemiplegia frequently accompanies motor aphasia since the cortical area which controls body movements is adjacent to the area which controls the movements of speech and both may be damaged by a single lesion. A lesion in the right hemisphere which results in a left hemiplegia seldom causes severe disturbances of speech. When a lesion occurs in the parietal-occipital areas there may be defects of vision such as hemianopsia (blindness in one half of each visual field), intermittent blurring of focus, or restricted visual field. Lesions of the parietal-occipital lobe may also cause visual agnosia (the loss of the ability to recognize objects by sight), or reading and writing defects. Hemiplegia, hemianopsia, and occasional blurring of focus are the symptoms which are most frequently seen by the speech therapist as accompaniments to aphasia. The occupational therapists and the physical therapists will see other manifestations of brain lesion where speech and understanding are not defective.

It is the responsibility of the physician or surgeon to diagnose and treat the pathology which destroys brain tissue and results in defective performance. If the patient's condition is relatively stable and the prognosis favorable, he is sent to the occupational therapist, the physical therapist,

Speech therapist, the Department of Speech Correction, the Central Institute for the Deaf, St. Louis, Mo.

*This article is adapted from a paper presented at the joint meeting of the Physical and Occupational Therapists of Missouri, Feb. 1951.

or the speech therapist, according to the kinds of symptoms he presents. In many cases of aphasia all three branches of therapy are needed for rehabilitation. It is the responsibility of the therapists to minimize the defects of performance or to find new patterns of behavior to replace those lost.

Most of the larger cities have all types of services available, but in many places one therapist may have to substitute for all. A speech therapist is not equipped to give occupational therapy activities nor can he attempt the treatments of the physical therapist, but he can find some activity or common sense exercises to encourage attempts at gross movements of paralyzed arms or legs. For example, he can always make the hemiplegic wield a broom with both hands, if the patient is ambulatory. The therapist can figure out ways for him to learn to do things for himself with the good arm. The physical therapist or the occupational therapist cannot be expected to know the technics required for speech rehabilitation but he can encourage the patient in his attempts at speech, help him learn the names of objects, make writing movements with the left hand, if necessary; copy words or sentences for writing practice, and teach him many of the everyday expressions such as "hello," "goodbye," "I'm fine," or "I want some ——." These activities are more or less at the primer stage professionally, but they may show surprising results in some cases. At the least, they can keep a patient cooperative and motivated until specialized therapy can be obtained. It is interesting to note that education of an aphasic can be successful even when it is postponed for several years, providing the patient is cooperative.

Before any rehabilitation program can be instituted the defective performance must be recognized and evaluated. Although the majority of aphasic patients are sent to Central Institute for the Deaf by their doctors, a large percentage of them come on their own initiative. Therefore, the speech therapist must be capable of making a diagnosis of the aphasic symptoms and a prognosis as to the possibility of reeducation. Even if a case is sent to the therapist with a diagnosis of "motor aphasia," "sensory aphasia," or some such classification, an individual evaluation must be made because of the great diversity of defects which may be grouped under a single classification.

Except in a few large university clinics or military hospitals personnel and time are seldom available for elaborate testing programs. Aphasics are difficult to test with any of the recognized psychometric or educational test batteries since their reactions are variable and difficult to score. Most of the information needed to determine if the prognosis is favorable and to diagnose the major language disabilities can be discovered in an informal interview with the patient and a member of his family. The patient is encouraged to give as much of his own history as he can. During the course of the interview the examiner can estimate what language skills are defective and can formulate a tentative program of training. A more detailed assay and diagnosis can be made as teaching progresses.

The aphasic must be put at ease in the beginning of the interview if full cooperation is to be attained. A sympathetic but realistic attitude is important. If a friendly relationship is established, the patient will usually volunteer information to the best of his ability. No matter how limited his speech, there is generally something that he can contribute to the conversation. Care and ingenuity must be used in interpreting his responses so that he will not be discouraged in his efforts to communicate. In the course of the interview a reasonably comprehensive diagnosis of the language problems can be made. The general type of residual speech and language ability is demonstrated. It can be determined readily whether the patient can speak in single words only, in phrases, or can maintain his part in a conversation with only an occasional groping for words. The action of his speech muscles is observed to see if they coordinate easily for the clear pronunciation of words, or whether they are sluggish or show evidence of partial paralysis. He can be asked to imitate some words and some tongue and lip exercises to ascertain his ability in voluntary movements. A tentative assay and diagnosis of understanding of speech is based on his responses, in both speech and actions, to questions and directions. An informal test of his ability to name objects and to read, write, or copy is given. His ability to name numerals, to tell time, to count change, and to do simple arithmetic are not difficult to test informally.

A skilled examiner can cover all of the program given above in approximately an hour and determine in a general way the patient's type of personality and adjustment to his condition, while judging the defective performances. However, even an unskilled examiner can discover many of the major aphasic symptoms by following a similar outline.

There is so much variation in symptoms and so much overlapping between sensory aphasia, motor aphasia, and the other commonly recognized types that the relegation of an individual to any one classification is of questionable value in formulating teaching procedures. When classi-

fication is necessary, rather general but more or less traditional terms are satisfactory for grouping some of the more prominent types of aphasic symptoms. There are many subdivisions to these terms in the literature but it is seldom that a patient fits a detailed classification with any degree of accuracy. Therefore, a broad division allows more grouping while indicating the major symptoms.

Before describing some of the traditional aphasic syndromes, it should be reiterated that there is no clearly defined borderline between one type of aphasia and another. As a general rule, there are elements of all types in every case. A patient who shows no defects in understanding during an interview or in everyday situations may become confused in a group conversation or find it difficult to follow the context of fast speech. Such a patient is justifiably classified as a motor aphasic if his other manifestations fit that category, rather than a sensory aphasic where lack of understanding is a prominent defect. With these reservations in mind, some of the symptoms characteristic of the broad divisions of aphasia can be reviewed.

Motor aphasia, sometimes called expressive aphasia, is the result of damage to or isolation of Broca's area in the third frontal convolution of the cortex. The outstanding characteristic of this group is speech which is scanty in the early stages of recovery and which may consist only of emotional expressions, in some instances with profane connotations. Nouns and verbs may return gradually and then "telegram" style sentences, in which only the words essential to the thought are expressed. "Ball game, radio," may suffice for, "I listened to the ball game on the radio." A word or short sentence may be said spontaneously in an appropriate situation when it cannot be said intentionally. Sometimes spontaneous recovery may continue to the point where virtually normal sentence structure is marred only by the occasional loss of a word needed to complete the thought.

The understanding of speech is apparently normal or only slightly defective.

Motor aphasia is also characterized by difficulty in articulation. Words may be slurred and speech difficult to understand even in cases where sentence structure is not markedly defective. In some cases, words or sentences may be pronounced clearly but they are produced with effort. A loud voice and explosive articulation sometimes accompanies the stage of recovery where the vocabulary is restricted to single words and short phrases; it is as though a violent approach were necessary to bring forth the speech. An attempt to imitate a word or sound is frequently unsuccessful, although every effort is made to follow the movements of the speaker. Mistakes are usually recognized even though they seldom can be corrected without assistance. The word wanted usually can be selected from a group of spoken words offered, but cannot always be repeated.

Cases are seen where improvement stopped early and others where speech and language returned rapidly until they approximated premorbid ability. However, the motor aphasic seldom talks effortlessly, even when his language usage is good. His verbal output is noticeably labored because he needs to concentrate on what he is saying and his timing is slower than that of the normal speaker.

Reading and writing show disturbances in varying degrees ranging from a complete loss to minor difficulties. The motor aphasic may be somewhat more proficient at silent reading than at oral reading.

Sensory aphasia is also called auditory aphasia or receptive aphasia. It is the result of damage to or isolation of Wernicke's area in the first temporal convolution of the cortex. The outstanding characteristic is severe loss of the ability to understand spoken language without loss of the ability to hear it. Speech may be normal in timing and articulation, but it is often unintelligible because of confusion in the word sequence of sentences, frequent use of the wrong word, or senseless sound patterns. A sound pattern such as "do de do" may be consistent and repeated for every speech attempt, or the sounds produced may vary. A word or short phrase such as "every day" may be said in attempts at speech although there is no apparent relation to the statement or question it is supposed to answer. The sensory aphasic seldom recognizes his mistakes and may become irritated when he is not understood.

Reading and writing are usually severely defective

Sometimes the ability to understand language returns to a large degree and sometimes the severe loss of comprehension persists. Some patients improve with teaching and a limited vocabulary can be taught. However, many cases of sensory aphasia are the result of diffuse lesions caused by extensive cerebral hemorrhages in old age and the possibility of recurrent insult is great. In such cases the prognosis is poor and rehabilitation is seldom attempted.

Amnesic aphasia has no clear anatomic basis. It has been variously attributed to lesions in the frontal, temporal, or parietal lobes or to diffuse lesions. It is not a common form of aphasia but it is distinctive in character. Amnesic aphasia is

distinguished by normal articulation of the majority of the words spoken and by speech which is frequently plentiful but rambling because the patient is unable to evoke words as names for objects, conditions, or qualities.* He is often unable to complete a sentence because he cannot remember the word needed and starts over in an attempt to reword or to describe the thing he cannot name. Recognition of the word wanted and the ability to repeat it when it is said for him, combined with an inability to retain it, is typical of amnesic aphasia.

Understanding of spoken language is usually good

Most descriptions of amnesic aphasia in the literature mention that reading and writing may show little or no disturbance. However, a patient whose ability to read and write was almost completely lost was taught at Central Institute recently. His difficulties were not the same as those usually found in reading and writing disturbances associated with the other types of aphasia. He could occasionally associate a mental image or meaning of some kind with a printed word but he could not say the word itself. For instance, he might look at the word "house" and say "home." He saw the verb "killed" in a newspaper headline and pointed to it, saying, "like Flit on a fly." He could copy printed or written forms but he could not transpose the printed letter into its cursive form, and the material copied had no meaning for him.

There are three other terms which are useful in describing specific aphasic defects. Some authorities consider these as separate types of aphasia, but they usually appear as part of the aphasic syndrome rather than as isolated pathologies. The terms agraphia, alexia, and acalculalia indicate loss or severe disturbance of writing, reading, and arithmetic respectively.

Agraphia, or severe defects of writing, may be a symptom of apraxia or of aphasia. It is apraxia when the writing movements are confused or difficult to initiate and letters cannot be formed because the movement patterns used in writing are lost. It is aphasia when the ability to write letters, or at least copy them, is intact, and the defect is in relation to the writing of words. Such disturbances are usually the consequence of language defects, but do not always parallel the ability in spoken language.

In alexia the reading ability is severely damaged or totally lost so that groups of words in sentence form convey little or no meaning, even though an occasional word may be recognized or associated with an object.

Acalculalia is the loss of the ability to calculate. Numbers and calculations are greatly dependent on language and their use may be disturbed in various ways by a brain lesion. At least two definite types of defects can be classified. The most frequent difficulty is the loss of names for numbers. Such patients are sometimes able to write the numeral they cannot name, but they work slowly and find it difficult, if not impossible, to handle large numbers or to carry digits in adding, subtracting, or multiplying. Teaching procedures designed to improve number naming frequently result in greatly increased ability to calculate. However, the loss of number names may mask a more severe disturbance of ability in arithmetic where the arithmetical processes or even the basic number concepts are lost or damaged. The patient cannot write a numeral if the name is dictated. Even after the number names have been relearned, arithmetic is impossible because he cannot remember how to perform the steps used in the various forms of computation. The teaching of arithmetic to this type of patient requires a complete review of addition, subtraction, multiplication, and division.

The preceding interpretations are extremely broad and each one covers many variations. Nevertheless, they serve to provide a concise manner of indicating predominant aphasic manifestations.

There are no universally accepted technics for teaching the aphasic. Some therapists believe that the presentation of a word as a whole is preferable, some separate the teaching of speech from the teaching of reading and writing, while others believe that normal associations are more nearly approached by the use of phonetic analysis and synthesis of words and believe that the three forms of language usage, speech, reading, and writing, must be closely allied in all teaching. There is general agreement, however, on a few basic principles. The most important of these is that the aphasic requires a great deal of repetition before new learning is retained. Secondly, he must not be given a variety of new material at one time. Thirdly, any methods used must be adaptable to the individual needs of the patient.

The procedures used at Central Institute include phonetic analysis and synthesis of words and combine practice in reading, writing, and motor speech in close relationship. It is, of course, impossible to give any detailed descriptions of teaching methods in a short discussion, therefore only general

*Weisenburg, T., McBride, K. E., *Aphasia, A Clinical and Psychological Study*. New York: The Commonwealth Fund, 1935. p. 146.

patterns of some of the procedures used can be given.

Lip and tongue exercises precede all speech work. They are particularly important when the speech muscles are affected by paralysis or when there is motor aphasia. When a sound is to be taught, an exercise involving the specific movements needed is stressed to give practice in the kinesiology without the added problem of coordinating voice or breath. When voice or breath is coordinated and the sound is adequately produced, it is written in a special progress book and made part of a syllable drill. The individual phonetic elements or speech sounds such as "t" and "oe" of "toe" are taught separately but they are not kept in isolation. As each new consonant symbol and its associated sound is learned, it is combined with various vowels in a syllable drill, from which words are built. The first words given are one-syllable words which can be formed by the addition of a single consonant to a syllable from the drill given.

pa-e	pai	pay
po-e	poa	po
pi-e	pigh	pi-e
pee	pea	pe-e
poo	poo	poo

pane	pose
pace	pie
pail	pine
pair	pipe
paid	peel
pay	peach
pole	pool

Figure 1. A typical syllable drill and word list.

Each new sound or word is read aloud with careful and firm articulation. Each new sound learned is repeated in drills, in words, and in writing until the patient can say it alone or in sequence, and until he can write it from memory. As the patient progresses, the memory for sound sequence and articulation returns with greater ease and there is a more rapid learning of new words.

Each new word written in the notebook is first read as individual sounds. The word "pane" above becomes "p..... a..... ne" until the movements required are learned and the speech muscles move easily through the positions. Repeated practice improves the coordinations until the word can be said smoothly and clearly. Premature blending or combining of the sounds usually defeats the purpose and the original defects reappear.

In severe loss of understanding the word is written under a picture of the object in the notebook so that an association is formed between the object, the spoken word, and the written symbols. When the word can be said from memory, the patient gives the word when the picture alone is shown. Next he chooses the picture from a group when he hears the word. Then he is shown the picture again and required to write the name of the object from memory.

The time spent on phonetic drills and vocabulary will vary according to the needs of the patient. In severe cases the beginning steps of learning the first few sounds must be repeated over and over again until memory for the movement and association for each sound becomes fixed.

It might be well to stress at this point that the purpose of this method of teaching is not to have the patient memorize every word which he is likely to meet in reading or speech. On the other hand, every step is planned to give him a technic for reading and learning words which he does not immediately recognize. He is also being trained in sound discrimination for recognition of words he hears and for recalling and using words in speech. By the time sentences are presented, the problem of unfamiliar words can be solved with only a minimum of help from the teacher.

Because of the individual difference in aphasics, the reading abilities cover a wide range and the first printed books vary in reading level. In practically all cases the phonetics are taught either for motor speech defects or for reading. The only exceptions are a few cases where reading is virtually intact and the speech shows evidence of spontaneous recovery. In such cases some of the sounds are given initially and only those causing special difficulties are given systematic drill. Sentences are introduced early and an oral reading may be used early in the training as a vehicle for speech practice.

Where the reading disability is severe or language consists of single words or phrases, the first sentences are written in a special notebook and usually start with a form of picture description. Names of objects in the picture are listed and articulation practiced for reading and understanding. Simple sentences which are repetitive in character are then written under the picture. For example, a picture of a room may be accompanied by the following sentences:

A lamp is on the table.
A rug is on the floor.
A book is on the desk.

Pronouns, prepositions, articles, and connectives are frequent sources of confusion in both reading and speech since they are more abstract than the nouns which can be directly associated with a definite object. Many verb forms are also difficult.

Since attempts to explain the meaning of the more abstract words are confusing to the patient, if not impossible, the only practical procedure is to teach these words in their places in the sentence structure until they assume meaning by use. The motor aphasic will recognize the words when he hears them used by others, but often cannot express them for use in his own sentences. Exact repetition of sentence form must not be carried to the point where it becomes monotonous, or until repetition is automatic. The sample sentences given earlier could be followed by sentences using "is in." The introduction of a change in the material after the motor speech pattern is learned, but before it is automatic, induces cerebration and is essential to training in the flexibility required before a printed book can be read. The sentences gradually develop story form with the changes in construction progressively increasing in frequency and difficulty.

When sentence structure is defective, the sentences are memorized until they can be given in answer to a question. Questioning is used in all cases to check understanding of the material read, but where the defect is in articulation or reading, and sentence structure is good, the memorizing is not necessary. There are a few patients whose understanding of speech seems to be good and who can respond intelligently to complicated questions about their own interests or activities but who are completely confused by a simple, direct question about a picture or story, or about something outside of their personal environment. For instance, a patient may show understanding and be able to answer the question, "What color suit are you going to buy?" yet be thoroughly lost when a picture is held up and the question, "What color is the car?" is asked, even though he had just read the sentence which gave the answer. Similar gaps in understanding infrequently appear in reaction to directions or commands and can make a patient appear stubborn or stupid, especially if he is the type who attempts to hide his defects. Training in understanding questions is given by associating question forms with appropriate answers until repetition forms a relationship between question and answer which will give meaning to the question itself. Each type of question form—such as "Where is the ?" "What is the doing?" "What color is ?" or "How many ?"—must be practiced with a variety of answers before it is fully understood.

When the problem is one of reading without severe speech difficulty, the step of sentences written in the notebook need not be carried on long before a transfer can be made to the printed page.

All reading throughout the training is oral although the patient is encouraged to try to read silently whatever he can outside of the lesson periods. Oral reading affords practice in articulation of connected language and also allows the teacher to see where and what reading difficulties occur. A clear articulation is demanded and all word endings are definitely sounded. Accuracy of articulation in oral reading not only improves the reading ability but has shown its value in many cases in overcoming slurred articulation and dropped endings in speech.

When paralysis of the right hand accompanies aphasia the patient has to learn to write with the left hand. The change of hands is made only when the paralysis of the preferred hand is so severe as to make writing impossible. The old-fashioned writing exercises, circles, and running circles are valuable in learning control of line and direction of movement. Practice on the blackboard encourages a free swing to the movements and should be used if the patient is able to stand. If a blackboard is not feasible, the writing should be introduced on paper with a soft pencil and a minimum of restriction to lines. A wooden or composition board with a large clip on the top is almost essential for writing by the hemiplegic. Paper clipped on the board is held steady even when the writing movements are uneven and awkward. Single letters such as "e" and then "l" can be developed from the running circles. "O," "a," "d," and "g" follow easily. Sometimes the main problem is learning to control the movements of the left hand and the patient can begin to practice writing words in a short time. It is important for a patient to learn to write his name as early as possible. All of the aphasic veterans who came to Central Institute in the past few years had learned to copy words and to write their names, even when they had been in hospitals where speech therapy was not available. They had been taught by the occupational therapists or the physical therapists who started them practicing as early as possible. In many cases the fact that they could learn to write, even in a limited way, gave them hope for the future and a willingness to attempt more difficult skills when the opportunity came.

In large rehabilitation centers, such as service and veterans hospitals and a few new civilian centers, all forms of therapy are under one roof or in close contact so that patients can be studied in conference. Any specific language needs or problems displayed in the workshop or during physical therapy treatments can be brought out and the speech therapist can give some idea of how much speech or reading to expect from an individual patient.

Projects in the workshop or special exercises or treatments can be made the subject matter of some speech lessons. However, such conferences are not available to many therapists who would like some general ideas which might be helpful in communicating with aphasics, or in improving their speech. Several of the following suggestions have more practical value for the occupational therapist than for the physical therapist since the former is in a teacher-pupil relationship in much of his contact with the aphasic. It would be difficult for the physical therapist to attempt to teach an aphasic the terminology of the treatments he gives him. The following suggestions are presented in the hope that some of them may help in a small way the complicated task of rehabilitation of the aphasic:

First: Speak slowly and distinctly when talking to an aphasic patient. This does not mean that it is necessary to slow the speech enough to make it obvious, but articulation should be clear, without slurred words or endings.

Second: Present a single idea at a time, when the patient is required to make a choice. For example, ask him, "Would you like to make a rug?" . . . "Would you like to make a hot pad?" so that he has a little time for consideration between each idea, rather than, "Would you prefer to make a rug or a hot pad?" which would confuse many an aphasic.

Third: If a patient is struggling to think of a word, help him say it, but only after he has been given a reasonable chance to find it himself.

Fourth: If there is any doubt about a patient's ability to read directions, ask him if he has any trouble with reading. Many aphasics will attempt to hide their disabilities but they are usually glad to have them understood.

Fifth: Be sure the patient knows the name of the object he is making or working with if it is not too technical. Have him repeat the word, then say, "Let me write it for you so you can study it a little," or something similar, then say it for him again. Whenever possible, give him the written word as well as the spoken pattern. Try to give him the names of his tools in the same way. If directions can be written for him, write in simple sentences.

Sixth: If a patient can use even limited speech, don't talk for him or let him resort to gestures alone. Help him when he needs it, write it for him to read and study if he can, hold him to the point if he rambles, but make him use as much speech as he can as much as possible.

Programs for the Physically Disabled

For the information of interested persons and organizations, the International Society for the Welfare of Cripples, 54 East 64th Street, New York 21, New York, has assembled summary statements concerning the work being done for the physically disabled in various nations throughout the world. The information for each country has been provided by the National Secretary of the organization in that country affiliated with the International Society.

More complete details concerning the program in any of these nations, or in other nations, may be secured from the International Society or from the National Secretary in the appropriate nation.

Challenge of the Scientific Method

(Cont. from page 467)

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Editorials

It is generally agreed that the continued growth and advancement of physical therapy as a necessary and valuable medical service is dependent on many factors. Considerable time and effort must constantly be expended on many projects, both large and small, and at every level from individual departments to the national executive group. Evidence is plainly before us from many sources that such activity is going on constantly and reliably, and the results of such activity are evident to each of us. A short time ago we read of the year's accomplishments as set forth in the annual reports, and undoubtedly each member felt a deep personal pride in every phase of our professional growth. From day to day in our work we are reminded of the extent to which physical therapy has become an important and recognized member of the family of medical sciences. In all, it is a satisfying and gratifying experience to contemplate the present status and maturity of our chosen profession.

But beneath all of this lies an element of danger which should be recognized and appreciated by every one of us. This element, we feel, is best described by the term "complacency." It is unfortunate that even a small measure of success in establishing a sound, vital, and active organization should in so many cases be accompanied by the feeling, that once a pattern is established, the work is done. It is a fact that this occurs in many instances, and results primarily from individual rather than group reaction. Too many of us, once the initial stimulus of overcoming obstacles and creating patterns and policies is finished, react with the attitude that someone else will now assume the responsibility and we can sit back and enjoy our accomplishments.

Perhaps the most unfortunate aspect of this complacency is that we tend to demonstrate it in relatively small ways which in themselves appear neither dangerous nor important. This attitude of "let George do it" is evident in the person who never quite manages to get to chapter meetings. It results in the growing numbers of members who consistently refuse committee appointments or, having joined a committee, allow other members to take the active role while they sit back and placidly agree with every move.

We see it manifested in the physical therapist who never quite gets around to wearing his APTA shoulder emblem, despite the obvious fact that this symbol continues to be the easiest and best way for him to identify both himself and his profession as a qualified member of the medical team.

Certainly we are all proud of the stature to which physical therapy has grown in a relatively few years. There is no one who would consciously or deliberately seek to lessen this stature or impede the progress which is presently under way. Each of us should evaluate his behavior in little things in the light of their eventual impact on the whole. The dangers of complacency arise from single acts and attitudes, and only through the efforts and enthusiasm of the individual can these dangers be avoided. An organization such as ours exists, grows, and accomplishes worthwhile objectives only in direct relation to the endeavors of its members, and will continue to be effective only so long as each of us continues to support and vitalize its policies in our own ways.

Association Activities

The Director Reports:

The December issue of the *Review* will carry a detailed account of my trip to Europe. We hope also during the coming months to have reports and impressions from other members who were there.

The World Confederation for Physical Therapy is now a reality, and I was honored by being elected its first president. All of us who were overseas made many new friends among our professional colleagues. Despite the fact that we spoke a different language, there was no lack of understanding professionally. Physical therapists the world over have common interests and goals. Technics of treatment vary no more in the countries visited than they do in various sections of our own country. The interest and enthusiasm for a World Confederation was heart warming.

During my stay, I attended the Second International Polio and Organizational Meeting of the World Confederation for Physical Therapists in Copenhagen, the Fifth World Congress of the International Society for the Welfare of Cripples in Stockholm, and the Annual Congress of the Chartered Society for Physiotherapists in London. In addition, I visited departments and met with the physical therapists in Helsinki, Finland, and Oslo, Norway.

I was extremely proud of our United States delegation, which consisted of twenty-five active members, one associate member, and two members of our medical advisory council. All will have much to share with you upon their return.

The next congress of the World Confederation will be held in London in September 1953. Why not plan now to attend.

—MILDRED ELSON
Executive Director

Chapter Activities

Kentucky

The Chapter presented an exhibit at the centennial meeting of the Kentucky Medical Society in Louisville, October 2-5. A further interprofessional relations project was sponsored by placing a congratulatory advertisement in the special Sunday supplement of the *Louisville Courier-Journal*.

Tennessee

At the November meeting of the Tennessee Chapter, it is planned to present a panel discussion on various aspects of state legislation to register physical therapists. Members of the panel will be a physical therapist, the State Commissioner of Public Health, a physiatrist, a voter, and an attorney.

Texas

The Texas Chapter presented an exhibit during the fifteen days of the Texas State Fair in Dallas.

Vermont

The Vermont Chapter is showing one of our national exhibits at a joint meeting of the New Hampshire-Vermont Medical Societies and later at the meeting of the Vermont Council of Social Welfare.

School News

During the past few months several changes have been made in directors of the approved schools. The following should be noted:

California—Childrens Hospital Society, Los Angeles. Sarah Rogers resigned, and Mrs. Grace Dodge is the newly appointed Technical Director.

Colorado—University of Colorado Medical Center. Mary Lawrence returned to the Army and Dorothy Hoag is the Acting Technical Director.

Kansas—University of Kansas School of Medicine. Lilyan Warner returned to the Army, but Ruth Monteith continues as Technical Director.

Minnesota—University of Minnesota. Ruby Green Overman, formerly Ruby Green, continues as Technical Director. At Mayo Clinic, Darrell Hunt is now Technical Director, replacing Harry Keown.

Ohio—Cleveland Clinic. Walter J. Zeiter, M.D. has replaced S. G. Gamble, M.D. as Medical Directer.

Texas—Hermann Hospital. Mary Elizabeth Kolb has resigned as Technical Director, and her successor has not yet been announced.

U. S. Army Medical Service. Letterman Army Hospital, San Francisco, has been added to the training hospitals for this course. Emma T. Harr, Major, WMSC, is the chief physical therapist at this hospital.

Mildred Elson Elected First President of World Confederation

A great honor was accorded our Association, along with the recognition of outstanding individual capability, when our Executive Director, Mildred Elson, was elected first president of the World Confederation for Physical Therapy at its organizational meeting held in Copenhagen, Denmark on September 7th and 8th, 1951. Reports of the meeting and plans for the new organization will be given in the *Review*.

We are extremely proud to have had Miss Elson serve as chairman of the planning committee, which has been working for two years to develop the World Confederation, and gratified that she was elected president.

Association Exhibits at National Society Conference

A new exhibit has been prepared for the American Physical Therapy Association, and was shown in Chicago at the annual meeting of the National Society for Crippled Children and Adults, Inc., at the Palmer House from October 3-5. This exhibit features a large map of the United States with 1950 census figures together with the number of physical therapists in each state and the proportion of therapists to the population. Illustrative examples of the job of the physical therapist are displayed on the wings of the exhibit.

A special feature of the convention was a series of professional seminars covering the subjects of diagnosis of cerebral palsy in the young adult, daily living activities for the crippled child, physical therapy, occupational therapy, speech therapy, social and emotional problems, and special education. Edna Blumenthal, director of Rehabilitation at the North Carolina Hospital for Cerebral Palsy, participated in the seminar. Other participants were Dr. Meyer Perlstein, Dr. George Deaver, Dr. Winthrop Phelps, Harold Westlake, Dr. Doris Phillips, Ruth Brunyate, Berneice Rutherford and Margaret Lefevre.

Mary Switzer, director of the U. S. Office of Vocational Rehabilitation, and Henry Viscardi, executive director of "Just One Break for the Disabled" committee, New York University, Bellevue Medical Center, described the role that volunteer agencies can play in defense mobilization.

Dr. Theodore G. Klumpp, president of the New York chemical firm of Winthrop-Stearns, Inc., and chairman of the President's newly formed Task Force to mobilize the handicapped for defense employment, spoke on the role of industry and management in employment of the crippled.

An actual clinic demonstration of handicapped workers in industry was conducted by Dr. George G. Deaver, past president of the American Academy for Cerebral Palsy, and professor of Physical Medicine and Rehabilitation, New York University College of Medicine.

The program marked the National Society's thirtieth year of service to the crippled according to an announcement by Lawrence J. Linck, executive director.

Poliomyelitis Research Project Started in Utah

Marian Jacobs has been released by the D. T. Watson School of Physiatrics for a four-month period to assist in a poliomyelitis research project in Utah County with headquarters in Provo, Utah.

The research is being directed by Dr. William McDowell Hammon, Professor of Epidemiology at the University of Pittsburgh, and Dr. Lewis L. Coriell. The project is sponsored through a grant from the National Foundation for Infantile Paralysis.

During the week of September 3rd, Dr. Hammon and Dr. Coriell directed the activities of selected physicians and nurses from various parts of the country in cooperation with local professional personnel, in carrying out the first controlled polio inoculation tests in medical history. The inoculations were given to 5,768 children between the ages of two and eight years.

Miss Jacobs is to remain in the area to collect data needed in evaluating the project. We shall look forward to reading more about this research project in the medical literature.

LUCY BLAIR

(Editor's note: Miss Blair has just returned from a field trip to Utah where she observed and assisted in setting up the Poliomyelitis Research Project.)

Membership News

Marriages

Elizabeth Ober, now Mrs. Elizabeth O. Compson, Lansing, Michigan.

Jean Marie Tyson of Warm Springs, Georgia, to Virgil Lee Du Val, Berkeley, California.

Margaret Bertolli of San Francisco, California, to J. Vincent Farley, San Francisco.

Doris Lee Fiedler of Hastings-on-Hudson, New York, to David H. Gilbert of Boston, Massachusetts.

Libbie Bornstein of Brooklyn, New York, to Edward A. Miller, Green Bay, Wisconsin.

Lois Magoon of Roxbury, Massachusetts, to George D. Rivers, Brookline, Massachusetts.

Edna Mae Poplin of Durham, North Carolina, now Mrs. Edna Mae P. Sharp, Hopkinsville, Kentucky.

Lettie E. Stewart of Spokane, Washington, to William Schwanz, Spokane, Washington.

Annetta Wardley of Denver, Colorado, to R. J. Vincent, Jr., Fort Lupton, Colorado.

Marguerite Watkins of Columbia, South Carolina, now Mrs. Marguerite W. Hutto, Fayetteville, North Carolina.

Judy Gates of Redwood City, California, to Douglas D. Stone, San Francisco, California.

Elsie Lampi of St. Paul, Minnesota, now Mrs. Elsie L. von Gardenheir, Carlsbad, New Mexico.

Nellie Ruth Day of Chattanooga, Tennessee, to Charlie A. Tucker, Jr., Evansville, Indiana.

Shirley Hanson of Seattle, Washington, to Lowell Knutson, Minneapolis, Minnesota.

Marion Urban of Iowa City, Iowa, to Andrew Konopisos, Fond du Lac, Wisconsin.

Ruby Green of Minneapolis, Minnesota, now Mrs. Ruby G. Overmann, St. Paul, Minnesota.

Name Change for Interprofessional Relations Committee Chairman

Our best wishes go to Annetta Wardley, chairman of the Interprofessional Relations Committee, who was married on October 1st and is now Mrs. R. J. Vincent. Committee Correspondence should be addressed to her at Box 447, Fort Lupton, Colorado.

Federal Legislation

Late information indicates that Congress will probably not enact any legislation this year providing Federal financial support of medical and allied professional schools.

This was embodied in S. 337, which proposed financial assistance to schools of medicine, osteopathy, dentistry, dental hygiene, public health, nursing, and practical nursing.

Coralyn Ada Davis passed away at Presbyterian Hospital, Chicago, Illinois, on August 22, 1951, following an illness of eight months.

After attending Northwestern University for two years, Miss Davis entered the Presbyterian Hospital School for Nurses from which she graduated in 1921, and joined the staff of the Visiting Nurse Association of Chicago. She continued in this service until her death, serving as a Supervisor in the Orthopedic Section since 1929. In 1930-31 she attended Simmons College School of Social Work, and the Harvard Physical Therapy course, and later, the course in Physical Therapy at Northwestern University Medical School, receiving her certificate in Physical Therapy in 1940. She was a part time instructor in Physical Therapy at Northwestern for four years.

The physical therapy profession has lost a valuable member with the death of Coralyn Davis. She had a great interest in the activities of the profession and served as president, and later as a member of the Executive Committee, of the Illinois Chapter. Her life was one of unselfish devotion to her patients and her work. She was an inspiration to her co-workers.

General News

State Legislation

California

Governor Warren did not sign the bill to register physical therapists and California still has no law.

Florida

The bill to register physical therapists is now law.

Illinois

The governor has signed the bill to register physical therapists thus making it law.

Massachusetts

The governor signed the bill on September 5th to register physical therapists.

North Carolina

The bill to register physical therapists is now in effect.

American Academy for Cerebral Palsy Announces Annual Meeting

The Annual Meeting of the American Academy for Cerebral Palsy will be held in Boston, Massachusetts, at the Copley Plaza Hotel, on Friday and Saturday, November 16 and 17, 1951. The Friday afternoon scientific session will be an open meeting and all physicians interested in the problem of cerebral palsy are invited to attend. The program will include:

The Cerebral Palsy Problem in 1951—Bronson Crothers, President
Physiology of Motor Learning as Applied to Cerebral Palsy—Frances Hellebrandt
Studies of Gait Patterns of the Hemiplegic Patient—Morton Marks
Surgical Methods for Functional Improvement of the Hand in Spastic Paralysis—William Cooper
Diastematomyelia—Franc Ingraham
Paradoxical Benefit of Cortical Ablation for Selected Hemiplegics—Wilder Penfield

Air Force Medical Service Assigns Physical Therapy Graduates

The first physical therapists trained under the auspices of the Air Force Medical Service graduated September 28 and have been assigned to their first duty stations as fully qualified PTs. Second Lt. Ramona I. Fiksdal of Arlington, Va., will report to Lackland Air Force Base, San Antonio, Texas; 2nd Lt. Olive Justine Potter of Wheelwright, Ky., to Maxwell AFB, Montgomery, Ala.; and 2nd Lt. Marilyn Louise Roehr of Milwaukee, Wis., to Sheppard AFB, Wichita Falls, Texas. All three WMSC officers attended Brooke Army Medical Center, Fort Sam Houston, San Antonio, Texas, for the first phase of their training. The second phase was completed by Lieutenants Fiksdal and Roehr at Walter Reed Army Hospital, Washington, D. C., and Lieutenant Potter at Fitzsimons Army Hospital, Denver, Colo.

Now in training are 2nd Lt. Priscilla M. Baker of Lynn, Mass, and 2nd Lt. Doris O. Dean of Avalon, Ga. For the second phase, Lieutenant Baker goes to Walter Reed and Lieutenant Dean to Letterman Army Hospital, San Francisco, Calif.

The third group of physical therapists began similar training October 10. They are 2nd Lt. Barbara B. Bugbee of Terre Haute, Ind.; 2nd Lt. Dotty F. Howell of Weatherford, Okla,; 2nd Lt. Virginia L. Pace of Clarksville, Tenn.; and 2nd Lt. Sarah Jane Watson of Pearsall, Texas.

Betty Jo Lawless Seifert of Camp Point, Ill., has recently been appointed first lieutenant, USAFR in the Women's Medical Specialist Corps. She reports for duty to Sampson Air Force Base, N. Y. A graduate of Western Illinois State Teachers College, Macomb, Ill., Lieutenant Seifert took physical therapy training at the University of Minnesota.

Army Medical Service Schedules Sixth Physical Therapy Class

The Army Medical Service is now accepting applications for its sixth Physical Therapy Class which is scheduled to begin in the spring of 1952.

This twelve-month course is open to qualified graduates of approved colleges or universities who have completed satisfactory courses in the biological and physical sciences and psychology. Young women selected to participate in this training program will be commissioned as second lieutenants in the Women's Medical Specialist Corps Reserve.

Requests for application forms or additional information concerning this course may be directed to the Office of The Surgeon General, Department of the Army, Washington 25, D. C.

Conference on Cooperative Relationships

A conference on Cooperative Relationships in Hospital and Post-hospital Rehabilitation of Veterans is to be held at the Veterans Administration Hospital, Hines, Illinois on Friday, November 2, 1951 from 9:00 A.M. to 4:00 P.M.

A number of outstanding speakers in the various fields of rehabilitation will take part in the panel and discussions.

Physicians and all other professional personnel are invited. There is no registration or other fee.

Louis B. Newman, M.D., Chief, Physical Medicine and Rehabilitation Service, Veterans Administration Hospital, Hines, Illinois, is chairman.

Reprints Available

Informational brochures may be obtained without charge. A small charge is made for the scientific reprints, as indicated. (Members of the Association, students enrolled in approved schools of physical therapy, and libraries may have one free copy of each scientific reprint, except the special issues of the *Review* and the Physiology Symposium, but must pay the indicated price for additional copies.) All requests should be addressed to: American Physical Therapy Association, 1790 Broadway, New York 19, N. Y.

PHYSICAL THERAPY—An illustrated brochure, describing the opportunities for a career in physical therapy, with suggestions for prospective students and a list of schools approved for physical therapy training.

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Sworn to and subscribed before me this 24th day of September 1951.

William Thoma

[Seal] NOTARY PUBLIC, State of New York

My commission expires March 30, 1953.

Abstracts

Costo-Clavicular Syndrome

Shelby G. Gamble, M.D., Cleveland, Ohio. In ARCHIVES OF PHYSICAL MEDICINE, 32:8:516, August 1951.

In the past one and a half years a total of twenty-two patients with a diagnosis of either scalenus anticus or costo-clavicular syndrome were referred for treatment. These patients have been followed for an average of seven months. Clinically they were divided into two classes: (a) neurogenic—those patients with complaint of pain plus paresthesia and changes in reflexes and/or circulatory disturbance, and (b) non-neurogenic—those with complaint of pain only. As these patients were followed, it became apparent that the non-neurogenic type usually became asymptomatic on conservative measures alone. The neurogenic type, while frequently improved to some degree by similar conservative measures, often required surgery.

In conditions of the cervical spine, osteoarthritis, subluxation, and protruded intervertebral disk, are most frequent. Patients with protruded intervertebral disks in the cervical region most frequently complain of pain through the shoulder girdle and upper extremity associated with paresthesia of the fingers and hand. Cervical traction usually is of value in giving at least temporary relief in conditions of this type which also is a differential point. Superficial heat, massage, active neck and shoulder girdle exercises, and correction of postural strain in addition to intermittent traction often give relief for varying periods of time.

Gamble concurs with the opinion that there are a number of conditions, many very poorly understood, which apparently can affect the brachial plexus in a mechanical manner. Many cases appear to be secondary to other underlying pathological conditions. The maneuvers commonly used as diagnostic measures are not completely reliable and, further, it is very important not to rely on a favorite test. The greater percentage of conditions, excluding the presence of a true cervical rib or a protruded intervertebral disk in the cervical area, respond favorably to conservative physical therapy measures.

Suction Socket: Proper Selection of Patients for Above-knee Artificial Leg

Charles O. Bechtol, M.D., Oakland, Calif. In THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 146:7:625, June 16, 1951.

The purpose of this paper is to present facts of clinical importance in the prescription and fitting of the suction socket above-knee artificial leg. The suction socket has been shown to be advantageous as a fitting method for most above-knee amputees. The actual fitting and alignment of a suction socket leg involves special problems of functional anatomy and gait. Four subjects of clinical importance are discussed: (1) the time required for the fitting of the suction socket, (2) the types of stumps in which difficult fit may be expected, (3) the type of surgical technic in amputation which produces a stump most favorable for fitting the suction socket, and (4) the postoperative care and preparation for the fitting of a suction socket.

Sutures should be removed at the end of the tenth day after the operation. During these ten days the patient should lie on his face in bed at least one hour a day to prevent the beginning of a flexion contracture of the hip. After removal of the sutures, the stump should be wrapped with an elastic bandage. This wrapping must cover the end of the stump by means of reverses, and it must come up to the inguinal fold in front of the leg and the gluteal fold behind, so that the subcutaneous tissues of the leg will be of uniform thickness. If only the lower portion of the stump is wrapped, the fitting of a suction socket will be considerably more difficult. In order to maintain the position of the wrapping high at the top of the stump, it is necessary to put on a spica type of bandage with several turns taken about the waist and the top of the stump in a figure eight. The purpose of the wrapping with an elastic bandage is to prevent the excessive accumulation of subcutaneous fat. The bandage does not interfere with development of the muscles. The stump should be bandaged night and day. The bandage may be removed during exercising or bathing of the stump. The muscle exercises are divided into two groups: first, those involving the muscles of the hip which have not been disturbed by the amputation; second, those mobilizing muscles of the hip that have been divided in the process of amputation. When the sutures are removed, active exercise of the hip muscles should be started. Extension and abduction should be stressed particularly, and the hip should be carried through a full range of active motion in all directions. As soon as the end of the stump is non-tender and able to tolerate a cuff, exercises against resistance should be started. It is of great importance in older amputees to prevent the formation of hip flexion contracture. The hip flexors should be stretched daily with the patient lying on his face and the stump placed on a pillow. Exercise of the severed muscles of the thigh should also be started ten days after the operation. These should consist of alternate contractions of the extensor and flexor muscles of the knee. At first, no attempt should be made at vigorous contractions, because of pain and the possibility of disrupting some of the muscle sutures. At the end of six weeks, vigorous contractions of these severed muscles may be started.

Muscle Relaxants in Low-Back Disorders

Editorial. In THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 146:10:930, July 7, 1951.

Schlesinger and Stinchfield reported recently on the use of the muscle relaxant mephenesin as a diagnostic and prognostic aid in acute disorders of the lower back. The drug was administered intravenously to sixty-four hospitalized patients with acute symptoms and signs of herniated intervertebral disk, and its effect on the pain and on the results of the straight-leg-raising test was observed. They noted four types of reaction: (1) abrupt relief of low-back and sciatic pain and striking increase in the range of leg motion, (2) abrupt relief of pain with only slight or moderate increase in range of leg motion, (3) abrupt relief of pain with no increase in motion, and (4) rapid relief of local pain, paradoxical aggravation of radiating pain, and decrease or no change in straight-leg-raising ability.

The muscle relaxation produced by mephenesin has also been found helpful as an adjunct to traction and in the relief of pain in various low-back syndromes, by the above-mentioned authors and by others, but it appears likely that the drug will have its greatest usefulness in differential diagnosis and prognosis.

Device for Grasp and Release by the Completely Paralyzed Hand

Herman Kabat, M.D., Ph.D., and Dorothy Rosenberg, O.T.R., Vallejo, Calif. In ARCHIVES OF PHYSICAL MEDICINE, 32:7:462, July 1951.

A device has been designed, based on the familiar principle of the "hook" used as a prosthesis by the amputee. Instead of the metal hook, a rigid, form-fitting, glove-like structure is made of cotton stockinet impregnated with Selectron plastic, which fits over and is strapped to the patient's paralyzed hand. The device is jointed, and the fingers and thumb of the patient are brought together in a firm grasp by an elastic band. The hand is opened by a harness and cable through motion of the scapula. Thus, power of elevation or abduction of the scapula, which is not of practical value when the hand is completely paralyzed, can be applied to opening of the hand to provide release of grasp. The power of continuous grasping by means of the elastic band requires no voluntary motion by the patient and is limited only by the power of release of grasp through scapular motion.

The device permits individuals with complete paralysis of the hand to grasp small objects and thereby use the hand to perform essential activities which previously had been impossible.

Recent Experiences in the Treatment of War Wounds of the Chest

H. A. Blake, Samuel P. Wise III, Vann S. Taylor, Stephen L. Kylar, Majors, MC, USA; Robert C. Major, Lt. Col., MC, USA, and James H. Forsee, Col., MC, USA. In UNITED STATES ARMED FORCES MEDICAL JOURNAL, 2:6:861, June 1951.

The combined efforts of the thoracic surgeon, internist, physiatrist, and the endoscopist emphasizing pulmonary function made thorough evaluation of each patient possible.

The physiatrist deals with the prevention of chest deformity and restoration of function. In a number of patients with borderline indications for decortication, improvement in pulmonary function following selective pressure-expansion exercises was such as to obviate operation. Selective breathing exercises were started early and vital capacity was recorded weekly. This form of predominantly unilateral breathing became virtually automatic with the patient in the preoperative phase so that postoperative maintenance of a mobile chest wall and diaphragm were greatly facilitated. In the immediate postoperative phase, pressure expansion exercises were begun on the ward. Proper bed positioning and assistance in shoulder motion exercises were cared for by the physical therapist. Breathing exercises for five minutes of each hour and shoulder exercises at three-hour intervals were accomplished. Frequent coughing was encouraged. Seven to ten days after operation, and following removal of the sutures, the patient was followed in the Physical Medicine Clinic with individual instruction and group participation, each once daily. Friction massage was applied to free the tissues in the region of the surgical scar. When satisfactory status was obtained, the patient was sent to the physical reconditioning gymnasium for continued group therapy and, from twenty-one to thirty days after operation, he was fully rehabilitated and ready for convalescent furlough. He was carefully instructed as to the importance of continuing pressure expansion exercises while at home.

Effect of Maintained Contracture on Physiological Properties of Muscle

Ernst Fischer, M.D., and Helen V. Skowlund, M.S., Richmond, Va. In ARCHIVES OF PHYSICAL MEDICINE, 32:7:441, July 1951.

The word "contracture" as used in this discussion is convenient in its vagueness for the designation of various states of muscle shortening or tightness, all of which have in common that their underlying mechanisms, although themselves not understood in all details, are different from normal reflex or voluntary tetanic contraction. This definition also includes states of muscle shortening associated with electrical potentials as well as electrically silent ones.

Three different types of experimental contractures are discussed: the contracture following tenotomy, that following experimental arthritis (synovial silver nitrate injection), and the contracture caused by local tetanus-toxin injection. Severe deterioration of the contractile power is much more pronounced in these conditions than in pure disuse atrophy. The decrease in relative dry weight, as well as in the concentration of structural and enzymatic proteins, is much larger than the decrease in relative "true muscle phase" caused by the atrophy. The electrolyte changes inside the muscle phase are more severe than in true disuse atrophy. Typical for myostatic contractures is a penetration of chloride into the muscle phase, which normally is chloride free. The histological alterations observed in these three types of contracture are not uniform in their details, but they all have in common an uneven distribution of the lesions through the whole muscle, while large parts of the muscle are of more or less normal appearance. Also, all the lesions observed show a part of the fiber content in the affected areas replaced by a fluid. The possibility is discussed that the fibers thus destroyed are fibers which shortened beyond their physiological limit. Such a self-destruction of the fibers probably could be prevented by an early therapeutic correction of the conditions causing the contracture.

Reconstructive Surgery of the Hand

William L. White, M.D., Pittsburgh. In THE PENNSYLVANIA MEDICAL JOURNAL, 54:4:330, April 1951.

Today traumatic injuries of the hands constitute a major portion of all injuries. Industrial estimates of hand injuries usually exceed 20 percent of all reported traumatic lesions. The management of these hand injuries requires a knowledge of plastic surgery, orthopedic surgery, neurosurgery, physical therapy, occupational therapy, and brace making, for reconstructive surgery of the hands must include treatment of the entire part, including all systems that may be involved.

In the management of joint difficulties of the hands, the first thoughts often will be directed to physical and occupational therapy and the use of activated splints, utilizing springs, or rubber bands. Physical therapy hastens the resolution of the processes of repair, occupational therapy develops useful motion, while active splints gently pull the stiffened useless joints into functional position and supply the movable parts with a gentle force to work against.

The rehabilitative features of surgery of the hand are not limited to any particular period, but should be continued throughout the entire management. Greatest emphasis, however, is placed upon the use of occupational therapy and work therapy, after completion of all surgical procedures. The place of physical therapy is limited beyond the point of aiding the recovery from the healing reaction.

Ultrasonics in Diagnosis and Therapy

Editorial. In BRITISH MEDICAL JOURNAL, No. 4712, p. 931, April 28, 1951.

Although ultrasonics were first tried in medicine about 1927 it is only in the last three years that there has been a flood of papers on the subject. The biological effects of ultrasonics have been extensively studied, and varying conclusions have been reached. It is, however, generally recognized that the principal effects on living tissues are mechanical, thermal, and chemical. The thermal effect is greatest at interfaces between tissue layers, as at fascial planes, joint capsules, and the periosteum of bone. In this way heating by ultrasonics differs from that of the various forms of diathermy and microwaves. Thus the logical application of ultrasonic energy in treatment seems to be in the promotion of local inflammatory reactions, and particularly the softening, by hyperemia and diffusion, of fibrous tissue deposits. Analgesic and spasmolytic effects have repeatedly been observed in the treatment of muscle and nerve lesions, and there is evidence of peripheral autonomic effects when ganglia are exposed to the ultrasonic beam.

Inflammatory conditions treated successfully include acute and chronic skin lesions, in particular chronic ulcers and sinuses. Localized scleroderma tous infiltration and Dupuytren's contracture have responded well. Traumatic and other soft-tissue lesions showing inflammatory and fibrotic change, such as bursitis, capsulitis, tenosynovitis, and tendonitis, are listed and seem logically suitable for treatment. Arthritic conditions, including osteoarthritis, osteochondritis, and especially early ankylosing spondylitis, respond by relief of pain and greatly increased mobility, and can be followed with exercises to maintain and increase joint range. True neuritis and neuralgia, as in post-herpetic pain, may be indications for trial of therapy.

Potential dangers in treatment should be stressed in this largely unknown field, and only those well versed in physical therapy should undertake its use. Many of the tissues and pathological conditions which have been reported as dangerous to treat by this method are probably only so if high intensities are used. The treatment of malignant tumors is rightly condemned. Nevertheless the destructive effects of high energy ultrasonics might well be investigated further. The use of ultrasonics after the manner of the diathermy cautery, and by cross-fire methods in the production of deep effects without injury to superficial tissues, may prove useful lines for investigation. It is likely that ultrasonics has a small but definite place in departments of physical medicine as a therapeutic agent. Careful and logical selection of cases on the known biological effects of ultrasonics should limit the application of treatment to the few conditions in which it is probably equal to, or better than, existing methods.

Work is progressing on the diagnostic use of ultrasonics, but so far, results are too few to assess.

Common Deformities in Cerebral Palsy

Harriet E. Gillette, M.D., Atlanta. In ARCHIVES OF PHYSICAL MEDICINE, 32:7:447, July 1951.

Treatment of deformity in cerebral palsy, as in any other orthopedic condition, is aimed at reestablishment of normal segmental alignment and functional position and is accomplished by means of strengthening, stretching, relaxation, bracing, and special equipment. The problem of controlling strength is confronted more frequently than that of supporting weakness in this group of syndromes.

In the feet the most common deformity is valgus, both of heel and forefoot. Treatment consists in application of well-fitting swung-in shoes with a long medial counter and medial heel-and-sole wedge. Activation and strengthening of the anterior tibial muscles may necessitate reinforcement by resistance to the hip flexors.

Hip dislocation presents a very serious problem and one which can be rapidly progressive. Corrective measures consist of a trial period of stretching of contracted adductors and hip flexors with long leg splints and spreader bar.

The scoliosis seen in cerebral palsy is by far more frequent in patients with spasticity and rigidities, although the fixed deformity also is seen in the athetoid group. Stretching, relaxation, and derotation exercises, in conjunction with bracing, corset, or acetate jacket, are indicated, both to stop progression of the scoliosis and, by stabilizing the trunk, to give increased use of the extremities. Control of extensor thrust, which is so common, is of utmost importance in obtaining early ambulation and self-help.

Shoulder deformities are most frequent and most severe in the spastic hemiplegic and follow the pattern of contracture in internal rotators, abductors, and forward flexors of the arm. Stretching, muscle reeducation, and strengthening comprise the active therapy, although a splint often must be applied to hold a functional position.

The typical hand position is that of wrist flexion with radial deviation, and flexion of fingers and thumb. A celastic cock-up splint, providing for finger and thumb extension, can be made easily and replaced as improvement occurs. Strengthening of extensors by physical and occupational therapy should proceed concurrently with the release of contracture.

Supervision of the cerebral palsied child should be carried on throughout the growing period, because even in mild cases deformities develop which can interfere with a useful life. Emphasis continues to be on prevention of deformity, with particular watch kept for the abnormal patterns which are most likely to occur.

Potassium Deficiency in Bulbar Poliomyelitis

Hyman S. Lans, M.D., Irving F. Stein, Jr., M.D., Robert J. Becker, M.D., Archibald L. Hoyne, M.D., and Karl A. Meyer, M.D., Chicago. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 146:11:1017, July 14, 1951.

Three patients with bulbar poliomyelitis were found to have a potassium deficiency. Treatment of the existing deficiency with intravenously administered potassium chloride resulted in a marked improvement of their condition.

Patients, suffering from bulbar poliomyelitis, who are unable to eat, will develop a potassium deficiency unless adequate potassium intake is provided. Severe, prolonged potassium deficiency can be lethal. This condition when present in patients with bulbar poliomyelitis may be a contributing factor in the high mortality rate. Proper treatment of electrolyte imbalance in these patients is essential and must include adequate potassium therapy. Further studies are indicated concerning the relationship of potassium deficiency to the clinical picture and mortality of poliomyelitis.

Electromyographic Study of the Superficial Thigh and Hip Muscles in Normal Individuals

Max D. Wheatley, Ph.D., and William Dean Jahnke, Iowa City, Iowa. In ARCHIVES OF PHYSICAL MEDICINE, 32:8:508, August 1951.

Electromyographic studies on various muscles, in recent years, have demonstrated new facts about the functions of the muscles under study. The scope of this work is such that no attempt is made to correlate the degree of activity with the work done, but to serve as a means of finding which hip and thigh muscles actually work during specific movements.

Most normal subjects can be trained to relax to a degree satisfactory for this kind of study, so that very slight voluntary movements produce measurable potentials. This validates the use of the electromyogram as an indication of the presence or absence of activity in a particular muscle during definite movements.

Recordings were taken from the muscles of eleven normal male individuals. The muscles from which action potentials were recorded were gluteus maximus, semitendinosus, semimembranosus, biceps femoris, rectus femoris, tensor fasciae latae, sartorius, gracilis, vastus medialis and vastus lateralis. Recordings were made from the upper motor point of the gluteus maximus only because of the fact that when surface electrodes were placed on the lower motor point of the muscle, the contracting muscle moved from beneath the electrodes involving the possibility of recording from the deeper muscles. The various movements were performed from certain fundamental starting positions: standing, prone, supine, sidelying and sitting.

No action potentials were exhibited by so-called resting muscle. The tensor fasciae latae was not found to be a flexor of the leg but rather an extensor of the leg and a medial rotator of the thigh from all of the positions tested.

The rectus femoris has two motor points: the one at approximately one-half the distance from the anterior superior iliac spine to the patella, and the other in the upper quarter of the muscle. Action potentials were recorded from the upper fourth of the muscle during abduction of the thigh.

Postural differences affected the extent of activity of the muscles during movements.

Muscles act in an associated manner in order to produce a movement rather than as straight agonists and antagonists. If the subject was relaxed, action potentials were not recorded from the antagonistic muscles unless great resistance was encountered.

Intractable Pain in the Neck and Upper Extremities with Particular Reference to Protrusion of Cervical Disks

J. Grafton Love, M.D., Rochester, Minn. In NORTH CAROLINA MEDICAL JOURNAL, 12:7:274, July 1951.

Pain in the neck and upper extremities is a common complaint. Before satisfactory treatment can be carried out, the attending physician must determine the etiologic factor and the pathologic process.

It is not uncommon for a person to have soreness in the neck following exposure to drafts. This condition probably is the result of a myositis, and usually will respond to the exhibition of salicylates and local heat with or without gentle massage.

The conservative treatment of the scalenus anticus syndrome, whether cervical ribs are present or not, is physical therapy in the form of local heat and massage, and exercises to strengthen the muscles about the shoulder girdle and so prevent sagging of the upper part of the chest. The scalene syndrome is more commonly seen in women than in men, and those women with large pendulous breasts should be instructed to use an adequate support.

Brachial neuritis is a diagnosis that formerly was rather commonly made in cases of pain involving the upper extremity or the shoulder girdle. Brachial neuralgia is associated with pain in the distribution of one or more nerves of the brachial plexus. If the etiologic factor cannot be determined when the patient presents this complaint, such conservative measures as resting the extremity, avoiding motions which aggravate the pain, the administration of salicylates, and the use of local heat and possibly gentle massage, should be outlined. The patient should be kept under observation and examined periodically for abnormal changes such as the loss of a tendon reflex, the loss or diminution of sensation, or the weakening of any muscle or group of muscles.

The conservative treatment of protruded intervertebral disk or of symptoms and signs of involvement of one or more nerve roots in the cervical region consists of the application of cervical traction. This may be done in many ways. Traction may be administered by means of a halter, under the direction of a physician or physical therapist. A homemade halter may be provided and the patient instructed in using it in his own bed. Traction can be applied at night when the patient retires, and he can sleep in the apparatus; or, if the pain is severe, it may be necessary to apply continuous traction day and night.

Some patients benefit from the application of heat to the muscles of the neck, particularly those posteriorly, and some feel better after gentle massage of these muscles.

Four case reports of protrusion of a cervical intervertebral disk are given in order to indicate the symptoms, signs, methods of investigation, and a type of treatment which has brought about excellent results.

Associated Movements Between Limb and Respiratory Muscles as a Sequel to Brachial Plexus Birth Injury

Peter K. Robinson. In BULLETIN OF THE JOHNS HOPKINS HOSPITAL, 80: 1:21, July 1951.

Simultaneous contraction of muscles which do not normally act together, although supplied by the same nerve, has long been observed to follow injury to that nerve. Such associated movements have been recorded following regeneration of the facial nerve by Gowers, of the oculomotor nerve by Bielschowsky, and Ford and Woodhall have pointed out that such phenomena also may be seen after regeneration of other peripheral and autonomic nerves. Little study, however, has been made of the associated movements after recovery from spinal root and plexus damage. Electromyographic records of such related activity between limb muscles after brachial birth palsy have been made by Leveuf et al. Likewise Sargent demonstrated action potentials, which were synchronous with respiration, in the biceps and forearm extensors in a patient

eighteen years after birth injury. Clinical records of the frequency of this associated activity, however, do not appear to have been made. Therefore, all adults available through the files of a general hospital, who had had brachial plexus damage at birth, were examined for evidence of such movements.

The eight unselected patients who had suffered brachial plexus birth palsy were examined at intervals of from nine to twenty-three years after injury. Associated movements between muscles of respiration and partially paralyzed limb muscles were found in six of them, as shown by contraction of the latter during deep inspiration. To demonstrate that such abnormal activity might occur as a result of damage either to the phrenic nerve, or to the nerve supply to the accessory respiratory muscles, the effect of use of the limb muscles on those of respiration was studied. Fluoroscopy in five of the six cases demonstrated diaphragmatic contractions in three, when the elbow was flexed. In one case, contraction of the limb muscles produced associated activity in one of the superficially placed accessory respiratory muscles. The explanation for these functional connections following injury is discussed and their probable frequency emphasized.

Old Bell's Palsy: Improvement after Electrical Stimulation: Report of Three Cases

J. L. Rudd, M.D., West Roxbury, Mass. In AMERICAN PRACTITIONER, 2:8:694, August 1951.

Electrical stimulation to the idiopathic type of facial paralysis after many years resulted in appreciable improvement in the three cases described.

These patients had "forgotten" how to move the involved muscles due to the length of time the nerve was unable to function and, therefore, carried along a paresis which probably would have cleared with earlier treatment but, apparently, would have remained paretic without the aid of physical measures.

Continued investigation in the use of electrical stimulation in old cases of Bell's palsy is advisable.

A few patients may be found who react to the rapid tetanizing current and who may expect some improvement.

Function of the Quadratus Lumborum

Miland E. Knapp, M.D., Minneapolis. In ARCHIVES OF PHYSICAL MEDICINE, 32:8:505, August 1951.

In standard textbooks of anatomy the quadratus lumborum is described as a muscle whose function is to draw the last rib downward and to bend the lumbar spine laterally and dorsally. It also is considered as a muscle which elevates the pelvis on the same side to lift the foot off the floor. In testing for its function the patient is placed on his abdomen on the examining table, and his ability to elevate the pelvis on the same side and to extend the back is estimated.

This study of the function of this muscle was initiated because, in a large series of poliomyelitic patients, it was observed that, in almost every patient with unilateral lower extremity denervation, the quadratus lumborum on the unaffected side apparently is paralyzed if the analysis of muscle function is made according to the usual concept of its function.

Conclusions made from this study are as follows: (1) The quadratus lumborum is a stabilizing muscle with triangular lines of force. (2) Paralysis of the oblique fibers on one side causes a dropped pelvis on the opposite side. (3) Paralysis of the oblique fibers of the quadratus lumborum is one cause of scoliosis. (4) Operative support in this area might be used to prevent scoliosis from this cause.

Status of Physical Medicine Rehabilitation Bed Services in Veterans Administration Hospitals: A Preliminary Report

Carl C. Hoffman, M.D., Washington, D. C. In ARCHIVES OF PHYSICAL MEDICINE, 32:8:529, August 1951.

Results cannot be summarized in tabulated form, in a preliminary report such as this, because the physical medicine and rehabilitation bed services have been too recently established to provide extensive statistical figures concerning accomplishments to date. Our main sources of information at present are derived from letters from hospital managers or by discussions with them when they visit the Central Office.

However, the opinions received from a great many of the managers in regard to the patients, who have received treatment on the physical medicine and rehabilitation bed services, are as follows: (a) It has provided more effective medical care for patients. (b) There has been an increased efficiency of personnel utilization. (c) It is becoming possible to discharge the majority of these patients from the hospital. (d) It is felt that there will result a reduction in the potential readmission of these patients.

Conclusions: The recent history, establishment, and present status of the physical medicine rehabilitation bed services in twenty-seven general medical and surgical, and nine tuberculosis hospitals have been discussed.

Their establishment is too recent to have provided material enough for extensive statistical reports of results obtained. Available reports reflect marked optimism as to future expectancy of accomplishments in the rehabilitation of severely handicapped patients.

It is hoped that faith and belief in this plan and these services will encourage other hospitals, both in and outside the Veterans Administration, to plan for their establishment in the near future.

The Retardation of Atrophy in Man by Electrical Stimulation of Muscles

Stafford L. Osborne, M.S., Ph.D., with the technical assistance of Aurelia Meloy, R.N., R.P.T., Chicago. In ARCHIVES OF PHYSICAL MEDICINE, 32:8:523, August 1951.

The muscles of six patients with extensive peripheral nerve lesions of the upper extremity were given daily electrical stimulation to determine whether atrophy could be retarded, and the atrophy occurring prior to institution of electrical stimulation could be reversed.

Atrophy was computed by means of monthly volumetric measurements.

Data have been presented to show that atrophy was retarded during the period of electrical stimulation.

The atrophy which occurred before electrical stimulation was started was not reversed.

It is our impression that electrical stimulation may be of value in re-education of the muscle.

Technique of Ultrasonic Therapy

Albert W. Bauer, M.D. In THE BRITISH JOURNAL OF PHYSICAL MEDICINE, 14:7:145, July 1951.

It is now well known that ultrasonic energy evokes a variety of biological responses of interest to therapy. Some of the medical applications of ultrasonics reflect the enthusiasm for new methods of treatment rather than clinical discretion or biological understanding. Others are well founded in clinical experience.

It should be noted that in the course of the last twelve years a certain technic was developed in the application of ultrasonic energy which, on the whole, has been taken into account in the design of ultrasonic equipment. Nevertheless, many problems are still unsettled. When choosing ultrasonic treatment one must select: (a) the frequency, (b) the type of waves, (c) the intensity, (d) the type of soundhead, (e) the method of application, (f) the duration, and (g) the number of sessions.

The main indications for the use of ultrasonic energy are the so-called rheumatic diseases. The ultrasonic energy tends to soothe and restore movement.

Apparatus to Facilitate Lifting Patients in and Out of Therapeutic Pool

Francis J. Fadden, Jr., M.D., and Hon. Arthur N. Pierson, Children's County Home, Westfield, N. J. In ARCHIVES OF PHYSICAL MEDICINE, 32:8:533, August 1951.

Where a therapeutic pool is available for the treatment of convalescent poliomyelitis patients there always has been the problem of transporting the patient into and out of the pool. It was found that the patient was subjected to six liftings or removals from the time he left his bed to his return, and the new apparatus was devised to eliminate at least four of these lifting incidents.

The first item of this apparatus is a waterproof nylon cloth stretcher, which has head and foot run pieces, onto which the patient is lifted at the bedside. This stretcher is then put upon the specially designed wheel carriage and delivered to the side of the pool. The stretcher with the patient is pushed onto the treatment table, which is equipped with guard run track to receive the run pieces of the stretcher.

The stretcher at the pool side and at the receiving level of the treatment table is one foot above the water level of the pool. The stretcher and patient are lowered into the water pneumatically to the coverage the physical therapist desires for the treatment.

After treatment, the air lift is applied and the patient raised to the level of the pool side and transferred back onto the carriage. The patient is then rolled under the shower and after the shower is transferred behind a disrobing curtain where the stretcher is transferred to brackets without disturbing him. After the patient is dried and ready for his bed, a blanket is thrown over him, the stretcher transferred to the carriage and the patient returned to his bedside.

In this manner, the patient remains on the stretcher during the whole process, only the bedside lifting is involved and the hazards of added transferring operation are avoided.

The whole process and the several pieces of equipment designed and made by the Simmons Company are more or less in the experimental stage and not in regular production. There is high promise that the methods employed and the equipment designed will prove an innovation in the hazardous and laborious task of transferring patients from one piece of equipment to another when pool treatment is involved.

The Diagnosis and Treatment of Conditions of Exposure: Trench Foot, Immersion Foot and Frostbite

Joseph C. Edwards, M.D., St. Louis. In THE JOURNAL OF THE MISSOURI STATE MEDICAL ASSOCIATION, 48:8:621, August 1951.

Patients with trench foot are divided into groups from mild, grade I, to grade IV.

The first principle in the treatment of trench foot is to have the patient rest in a cool place, keeping the body comfortable, warm and clean. The feet should be washed daily with soapy water at 70 F. and dried gently, and the surface of the feet cooled with air currents from a fan or by exposing them to room temperature not exceeding 70 F.—preferably 60 degrees. This and absolute bed rest promote vasoconstriction and decrease local metabolic requirements. The body should be warm with enough blankets to make the patient comfortable. If the patient is seen immediately after damage, before swelling has occurred, warming in air or water at body temperature may be of value; after swelling is present, warming may do more harm than good.

Some grade I mild, and grade I patients are permitted to walk to mess and to the latrine immediately. As soon as the acute pain has subsided, within a week in grade I and II, the patient is started on passive vascular exercises. He elevates his feet at an agle of 45 degrees on a board or chair in his bed for two minutes, rests them horizontally for five minutes, then sits with legs over the edge of the bed and dangles them for two, and later three minutes, followed by resumption of the horizontal state. This is repeated three or four times daily during the next week or two while the patient is at bed rest. This, plus calisthenics in bed every morning, conducted by the ward master, helps keep these patients in good physical condition. Cool water soaks and whirlpool baths at 70 F. for from twenty to thirty minutes daily helped temporarily; whether or not these shorten the period of recovery was not established. Patients with warm, swollen feet could not tolerate the cold water. Cooling the feet at bedtime would enable many to sleep without sedatives or analgesics. Some patients responded to applications of cold, even ice bags, with relief of pain.

Chronic Trench Foot: A Study of 100 Cases

Walter Redisch, M.D., Otto Brandman, M.D., Salvatore Rainone, M.D. In ANNALS OF INTERNAL MEDICINE, 34:5:1163, May 1951.

Close scrutiny of a group of 100 cases suffering from the chronic phase of trench foot has yielded further support to the concept that this condition is essentially characterized by a disturbance in regulation of peripheral blood flow. The most incapacitating feature of the disease is abnormal sensitivity to cold with a symptomatology comparable to intermittent claudication.

Buerger's exercises for one-half hour twice a day were used in the treatment of these cases.

Occupational Therapy for Cerebral Palsy

E. M. James, M.A., O.T. In THE BRITISH JOURNAL OF PHYSICAL MEDICINE, 14:7:149, July 1951.

Occupational therapy for cerebral palsy, in recent years, has become a very specialized field of work. Ideally, a child with cerebral palsy should be treated from babyhood by a team of therapists comprising a physical therapist, occupational therapist and, in many cases, also a speech therapist.

The entire program of treatment for a cerebral palsied child must be carried out by the whole team of therapists. For example, the physical therapist will teach the athetoid basic relaxation while lying, sitting, and later control of standing and walking. The occupational therapist will be the link between physical therapy and everyday life; she must carry the arm relaxation a stage farther and use it for arm occupations. The speech therapist will use relaxation to achieve control of speech. For the spastic and ataxic similar teamwork is necessary as determined by the different principles of treatment. Each individual cerebral palsy child needs to be handled as his handicap demands and this must be done consistently by all who deal with him, including the parents, to whom his particular problem must be explained. Their cooperation with the therapists is essential in the over-all aim of treatment if the child is to become capable of taking his place in the world.

Foreign Abstracts

The Behavior of the Diaphragm in Asthma: Utilization of the Iron Lung in the Treatment of the Disease

A. Bernard. J. Sc. Med. Lille, March 4, 1951. Reviewed in MEDICINE ET HYGIENE, April 1, 1951. *(Translated and abstracted by Signe Brunnstrom, Director of Physical Therapy, Kessler Institute for Rehabilitation.)*

X-ray examinations of the chest of asthmatic patients during an attack show that the intercostal spaces are enlarged and almost horizontal, the diaphragm is in a state of contraction and practically immovable. All accessory breathing muscles (scalenei, trapezius) are acting, and the shoulders are elevated. Respiration is no longer automatic. The patient must think of his breathing, and in particular of expiration.

To overcome the hypertonic condition of the diaphragm, and to bring about a more normal respiration, the author recommends the use of the iron lung. This treatment also acts favorably on the emphysema. The patient is placed in the iron lung for forty minutes two or three times a week. Other authors report good results by using the iron lung for one hour three times daily.

Reeducation in Poliomyelitis

Denis Leroy. In MEDICINE ET HYGIENE, March 15, 1951. *(Translated and abstracted by Signe Brunnstrom, Director of Physical Therapy, Kessler Institute for Rehabilitation.)*

Professor Leroy, chief of a poliomyelitis clinic in Rennes, France, reports on methods used in the treatment of poliomyelitis.

The author states that in poliomyelitis the power to contract often lies latent in the muscles, but that the kinesthetic memory has been lost. The patient has forgotten how to move. Often even the will to move has been lost. Restoration of function is related to three factors: the will to move, the knowledge of motions, and the ability to perform them. ("Le vouloir, le savoir, et le povoir.") Treatment must be directed toward anatomic-physiological restoration and toward psychomotor reeducation. The kinesthetic memory must be restored in order that motor impulses may be elicited.

Professor Leroy states that treatment methods used at his clinic have been inspired by the American School. Underwater exercises as well as skating exercises are used to overcome the effect of gravity. For the restoration of the kinesthetic memory, the importance of stimulating cutaneous, articular, intramuscular, and tendinous nerve endings is stressed, as well as the use of auditory and visual clues. The noise of the skate rolling on the horizontal board, directions given by the therapist in a rhythmic voice, and looking at objects to be reached are all useful agents. Various objects of an attractive character are shown to the patient. These objects give the patient the purpose of "reaching a goal." For the work in water small celluloid floating objects, such as balls, animals, boats, and letters of the alphabet are used. The objects are placed in such a position in relation to the patient that when he has to reach for them the desired motion is obtained. Color schemes are important. Patients respond better if they work with colors which they like.

For guided motions outside of the water a so-called "table psychomotrice" is used. This consists of a board, that can be placed horizontally or stood up against the wall, on which are lines, circles, points, and various patterns. The patient must try to follow the design with his finger, either as a free motion or with the arm supported on a skate.

Patients are treated as soon as the temperature is down, and such early treatment tends to minimize muscular atrophy of the affected parts, as well as of the unaffected muscles. The author believes that his method of paying attention simultaneously to anatomico-physiological restoration and to psychomotor reeducation accounts for the good results obtained at the clinic.

A motion picture film of Professor Leroy's method of treating poliomyelitis has been made.

Book Reviews

Orthopedic Nursing. *By Frederick J. Knocke, M.D., Adjunct Orthopedist, Lenox Hill Hospital; Attending Orthopedic Surgeon, Institute for the Crippled and Disabled; Instructor in Orthopedic Surgery, Columbia University, New York; Diplomate, American Board of Orthopedic Surgery, and Lazelle S. Knocke, R.N., B.S., Head Nurse, Women's Surgical Ward, Lenox Hill Hospital; Clinical Instructor in Orthopedic Nursing, Hospital for Special Surgery; Instructor (part time) in Nursing Education, Teachers College, Columbia University, New York. First Edition. Hard cover, price, $5.00; pp. 682, ill. 312. F. A. Davis Company, Publisher, Philadelphia, 1951.*

This first edition compiled by the combined efforts of two specialists and teachers, in their respective roles in the field of orthopedics, serves as an excellent text in that it gives both a doctor's and a nurse's viewpoint. There is a feeling of completeness as one sees the relationship of the nurse to the orthopedic sur-

geon, and the interrelationship of special therapies, employment agencies, educational institutions, and the facilities of public and private agencies.

The book is unique in that the *whole patient* is considered and that all phases of treatment are explained or described and not merely mentioned. The authors in order to make this an all-inclusive text have solicited contributions and material from authorities in their areas of specialization; as a matter of fact, several chapters, seven in number, have been written by authorities in psychology, rehabilitation, orthopedic implications in community nursing, physical therapy, occupational therapy, and daily activity teaching.

In dealing with their subject, the authors have emphasized the fact that the care of orthopedic patients is a specialty in itself, as are other phases of medicine and surgery. It requires a thorough and proper training and an acquaintance with all therapies involved in order to do the utmost for the patient.

Each chapter is followed by specific references, a listing of further sources of information including periodicals, books, pamphlets, agencies, and visual aids. In some instances, there are questions for study and discussion for student and instructor participation.

The final chapter illustrates the application of the fundamental principles of orthopedic nursing, using poliomyelitis as an example.

It is the opinion of the reviewer that this is an excellent textbook not only for nurses but for all personnel associated with the care of the orthopedic patient.

Reviewed by MARY E. CALLAHAN, *Associate Director of Training Courses for Physical Therapists, College of Physicians and Surgeons, Columbia University.*

Bases of Human Behavior (A Biologic Approach to Psychiatry). *By Leon J. Saul, M.D., Professor of Clinical Psychiatry, University of Pennsylvania School of Medicine; Psychiatric Consultant, Swarthmore College; Lecturer, Bryn Mawr College. Pp. 150, 8 illus. Price, $4.00. J. B. Lippincott Company, Philadelphia, 1951.*

This book emphasizes the dependence of behavior upon biological forces and the close relationship which exists between emotion and physiological change.

In the opening chapters the author calls attention to the fact that psychiatry to date has been essentially descriptive and custodial, but is now developing into a science concerned with the motivations of behavior having a biological basis, or with the "psychodynamics of behavior." After pointing out the changing trend and direction of the new science of psychiatry with its implications, a detailed description of emotional forces which may alter the physiology of the body is presented in the second part of the book. The effects of momentary and chronic emotional stress upon the organism, and methods and devices which the body uses in meeting these external pressures are discussed. Not only are these stresses and strains of life shown to be temporarily injurious to the organism, but over a period of time may cause actual tissue change and eventually structural damage. Structural changes in one organism in turn cause alterations in behavior, so that a vicious circle is set up in which psychogenic and physiological components are inseparable as causative factors of response.

The effect of emotional forces upon perception, thinking, feeling, and behavior is also indicated, and numerous illustrations from case histories are given. Interpretation is made in terms of basic psychodynamic theory.

The third part of the book is devoted to elements of psychodynamics. Here integration of the organism, structure of the mind, development of the id, ego, and superego are discussed as examples of fundamental concepts.

The author states that the book is intended for first-year students of psychiatry. As such it should fill a real need, placing emphasis as it does upon sound biologic mechanisms of behavior which are so often overlooked or taken for granted in treatises on psychiatry. The book is well written, has a clear, concise style, and is comprehensive, but well organized. Although academic in nature, it is interesting reading material also. It ought to be a genuine contribution to the science of medicine in leading the way for a more exact approach to human behavior.

Reviewed by BESSIE B. BURGEMEISTER, PH.D., *Research Assistant in Neurology, Columbia University.*

Scoliosis—Pathology, Etiology and Treatment. *By Samuel Kleinberg, M.D., Attending Orthopedic Surgeon, Hospital for Joint Diseases; Consulting Orthopedic Surgeon, Lebanon Hospital, Maimonides Hospital, Hospital for Special Surgery, New York; Lecturer in Orthopedics, New York University Medical School. Member, American Academy of Medicine; Member, American Academy of Compensation Medicine. Hard cover, price $7.50; pp. 286; illus. 163. Published by the Williams and Wilkins Co., Baltimore, Maryland, 1951.*

This book contains a great deal of information about the pathology and etiology of scoliosis, and about the anatomical and physiological basis of such deformities.

The chapter on history, symptomatology, examination, and records gives a good summary and outline of what to look for and what to record when examining a scoliosis patient.

The part on treatment is well organized and includes prevention and treatment of functional scoliosis, structural scoliosis, the use of therapeutic exercises, supportive and corrective apparatus, forcible correction, and surgery.

The chapter on treatment of postural deformities and scoliosis will be of special interest to the physical therapist.

The reviewer cannot go along entirely with the approach in this chapter. For instance, a number of exercises are described, and with each exercise, the number of times it should be performed is mentioned. Since the reviewer feels that dosage in therapeutic exercise should always depend on the individual case, it is hard for him to understand why a definite number of repetitions is advocated for specific movements. He feels that while a number of the exercises described have definite merit, the value would be enhanced by offering more specific indications and with it, a rational for appropriate dosage rather than a constant number of repetitions.

The book will be of great interest and value to physical therapists interested in posture work and scoliosis.

Reviewed by HANS KRAUS, M.D., *Assistant Professor of Physical Medicine, New York University-Bellevue Medical Center.*

Schools of Physical Therapy

APPROVED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS
OF THE AMERICAN MEDICAL ASSOCIATION

Graduates of these schools are eligible for membership in the American Physical Therapy Association.

Name and Location of School	Medical Director and Technical Director	Entrance Requirements	Length of Course	Classes Start	Certificate, Degree, or Diploma
CALIFORNIA					
[1]**Childrens Hospital Society,** Los Angeles (in affiliation with University of California, Los Angeles)	Samuel S. Mathews, M.D. Mary J. Dodge	a^3-b^3-d-e g^4	14 mo 4 yrs	Sept	Certificate Degree
[1]**College of Medical Evangelists,** Loma Linda	F. B. Moor, M.D. R. Wm. Berdan	a-b-c-d-e g	15 mo 4 yrs	Sept	Certificate Degree
[1]**Univ. of So. California,** Los Angeles	Charles L. Lowman, M.D. Charlotte W. Anderson	a-b-d-e g^4	14 mo 4 yrs	Sept Sept-Feb	Certificate Degree & Cert.
[1]**Univ. of California Medical School,** San Francisco	Lucile M. Eising, M.D. Margery Wagner	d-e g	12 mo 4 yrs	Sept	Certificate Degree
[1]**Stanford Univ.,** Palo Alto	Wm. Northway, M.D. Lucille Daniels	a-d-e-f g^4	12 mo 4 yrs	Jan-June or Sept	Certificate Degree
COLORADO					
[1]**Univ. of Colorado Medical Center,** Denver	Harold Dinken, M.D.	a^3-b-d-e g^4	12 mo 4 yrs	Sept	Certificate Degree
ILLINOIS					
Northwestern Univ. Medical School, Chicago	Emil D. W. Hauser, M.D. Gertrude Beard	a-b^3-d-e	12 mo	Oct	Certificate
IOWA					
[1]**Univ. of Iowa,** Iowa City	W. D. Paul, M.D. Olive C. Farr	b-e	12 mo	Sept	Certificate
KANSAS					
[1]**Univ. of Kansas School of Medicine,** Kansas City	Donald L. Rose, M.D. Ruth Monteith	a-b-d-e g^4	12 mo 4 yrs	Feb-Sept	Certificate Degree
MASSACHUSETTS					
Bouve-Boston School of Physical Education, in affiliation with Tufts College, Medford 55	Howard Moore, M.D. Constance K. Greene	g^4	4 yrs	Sept	Degree
Simmons College, Boston	{Wm. T. Green, M.D. {Arthur L. Watkins, M.D. Shirley Cogland	a^3-b-d-e g^4	16 mo 4½ yrs	Sept	Certificate Degree
Boston Univ.-College of Physical Education for Women, Sargent, Cambridge	Kenneth Christophe, M.D. Adelaide McGarrett	a-b-d-e f-g^4	12 mo 2 or 4 yrs	Sept	Certificate Degree
MINNESOTA					
[1]**Univ. of Minnesota,** Minneapolis	Frederic J. Kottke, M.D. Ruby Green Overmann	d-f-g^4	2 yrs	Sept	Degree
[1]**Mayo Clinic,** Rochester	Earl C. Elkins, M.D. Darrell Hunt	a-b-c-d-e	2 yrs	Sept	Certificate
MISSOURI					
[1]**Washington Univ. School of Medicine,** St. Louis	Sedgwick Mead, M.D. Beatrice F. Schulz	f-g^4	2 or 4 yrs	Sept	Degree
[1]**St. Louis Univ. School of Nursing,** St. Louis	A. J. Kotkis, M.D. Sr. Mary Imelda	f-g^4	2 or 4 yrs	Jan-Sept	Degree

Name and Location of School	Medical Director and Technical Director	Entrance Requirements	Length of Course	Classes Start	Certificate, Degree, or Diploma
NEW YORK					
Albany Hospital, Albany (in affiliation with Russell Sage College, Troy)	John W. Ghormley, M.D. Catherine Graham	a-b-d-e g[4]	12 mo 4 yrs	Sept	Certificate Degree
[1]**Columbia Univ.,** New York	Wm. B. Snow, M.D. Floy Pinkerton	a-b[3]-e f	12 mo 2 yrs	Sept	Certificate Degree
[1]**New York Univ., School of Education,** New York	George G. Deaver, M.D. Elizabeth C. Addoms	a[3]-b[3]-d-e g[4]	12 mo 4 yrs	Sept	Certificate Degree
NORTH CAROLINA					
[1]**Duke Univ., School of Medicine,** Durham	Lenox Baker, M.D. Helen Kaiser	a[3]-b[3]-d-e	15 mo	Oct	Certificate
OHIO					
[1]**Cleveland Clinic,** Cleveland	Walter J. Zeiter, M.D. Mildred Heap	a-b-d-e	12 mo	Oct	Certificate
PENNSYLVANIA					
[1]**D. T. Watson School of Physiatrics,** Leetsdale	Jessie Wright, M.D. Kathryn Kelley	a[3]-b[3]-d-e	12 mo	Oct	Diploma
[1]**Univ. of Pa. School of Auxiliary Med. Serv.,** Division of Physical Therapy, Philadelphia	George M. Piersol, M.D. Dorothy Baethke	e g[4]	12 mo 4 yrs	Sept-Feb Sept	Certificate Cert. & Degree
TEXAS					
[1]**Hermann Hospital,** Houston	Oscar O. Selke, Jr., M.D. Mary Elizabeth Kolb	a-b-d-e	12 mo	Oct	Certificate
[1]**Univ. of Texas School of Medicine,** Galveston	G. W. N. Eggers, M.D. Ruby Decker	a-b-e d	12 mo	Jan	Certificate Degree
VIRGINIA					
[1]**Med. College of Va.,** Baruch Center of Phys. Med., Richmond (in affiliation with Richmond Prof. Inst.)	Walter J. Lee, M.D. Susanne Hirt	a-b-d-e g[4]	12 mo 4 yrs	Sept	Diploma Degree
WISCONSIN					
[1]**Univ. of Wisconsin Med. School,** Madison	Harry D. Bouman, M.D. Margaret Kohli	a-b-c-e-f g[4]	12 mo 4 yrs	Sept Sept-Feb	Certificate Cert. & Degree
U. S. ARMY MEDICAL SERVICE					
(a) **Medical Field Service School,** Brooke Army Medical Center, San Antonio, Texas, and	Charles D. Shields, Lt. Col., M.C. Agnes P. Snyder, Major, WMSC	b-e	12[2]	Mar-Sept	Certificate
(b) **Fitzsimons Army Hospital,** Denver, Colorado	H. B. Luscombe, Col., M.C. Harriet S. Lee, Major, WMSC	Completion of Medical Field Service School			
(c) **Walter Reed Army Hospital,** Washington, D. C.	John H. Kuitert, Lt. Col., M.C. Brunetta Kuehlthau, Major, WMSC	Completion of Medical Field Service School			
(d) **Letterman Army Hospital,** San Francisco	Arthur E. White, Col., M.C. Emma T. Harr, Major, WMSC	Completion of Medical Field Service School			

Entrance Requirements

FOR ONE-YEAR COURSE

a = Graduation from accredited school of nursing.
b = Baccalaureate degree with major in physical education.
c = Two years of college with science courses.
d = Three years of college with science courses.
e = Baccalaureate degree with required science courses.

FOR TWO-YEAR COURSE

f = Two years of college with science courses.

FOR FOUR-YEAR COURSE

g = High school graduation.

Footnotes

[1]Male students admitted.

[2]12 months' course includes training at the Medical Field Service School and Fitzsimons, Walter Reed, or Letterman Army Hospitals. Apply directly to the Surgeon General, Department of the Army, Washington 25, D. C.

[3]Additional college science credits required.

[4]Advanced standing students accepted.

Please address initial correspondence to the School of Physical Therapy in the institutions listed. Tuition and fees will vary from school to school.

Meet Our New Contributors

John J. Blasko, M.D.—Director of Professional Education, Veterans Administration Hospital, Gulfport, Mississippi. Clinical Assistant Professor, Neuropsychiatry, Louisiana State University School of Medicine.

Dr. Blasko received his B.S. and M.D. from St. Louis University School of Medicine. He has served as Clinical Director, State Hospital No. 1, Fulton, Missouri, Assistant Medical Director of City View Sanitarium, Nashville, Tennessee, and Special Lecturer at the University of Missouri, Columbia.

Dr. Blasko is a Fellow of the American Medical Association, Diplomate of the American Board of Psychiatry and Neurology, and is a member of the American Psychiatric Association, the New Orleans Society of Neurology and Psychiatry, and the Missouri State Medical Association.

Dorothy Britton—Speech Therapist, Central Institute for the Deaf, St. Louis, Mo. Miss Britton was graduated from Washington University in 1943 with a B.S. degree in Education. In 1950 she received her M.A. degree in Speech and Hearing from the same institution.

Miss Britton is a member of the American Speech and Hearing Association (Advanced Certificate), the Central States Speech Association, the Speech Association of Missouri, and the National Forum on Deafness and Speech Pathology.

Lucian J. Zadrozny—Staff physical therapist, U. S. Naval Hospital, St. Albans, L. I., New York. Mr. Zadrozny attended the University of Connecticut and New York University. He received his physical therapy training from New York University, where he was graduated with a B.S. degree in 1949.

Prior to his recall into the Navy, Mr. Zadrozny was senior physical therapist at the Hospital for Chronic Illness, Rocky Hill, Connecticut. He was visiting therapist for the New Britain Memorial Hospital at New Britain, Connecticut, and was staff physical therapist at the New Britain General Hospital.

Mr. Zadrozny served in the physical therapy section of the Navy Hospital Corps for three years during World War II. He is a member of the American Physical Therapy Association and the American Registry of Physical Therapists.

Classified WANT-ADS

WANTED: Qualified assistant physical therapist. 300-bed general hospital. Modern, air-conditioned department. Good salary, complete maintenance. Write John W. Rankin, Director, James Walker Memorial Hospital, Wilmington, N. C.

WANTED: Two qualified physical therapists, male or female, for Rehabilitation Center treating industrial accident cases only. Good salary schedule, working conditions, five-day week, liberal holiday, vacation, sick leave and retirement system. Write Mr. Elmer H. Kennedy, Supervisor, Washington Rehabilitation Center, 708 4th Avenue, Seattle, Washington.

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WANTED: Two qualified physical therapists for a day school in Washington, D. C. Aptitude for working with cerebral palsied children desired. Scholarship available for additional training in C.P. Civil Service appointment. Contact Dr. Richard De Saussure, Health Department, Municipal Center, 3rd & C Sts., N.W., Washington, D. C.

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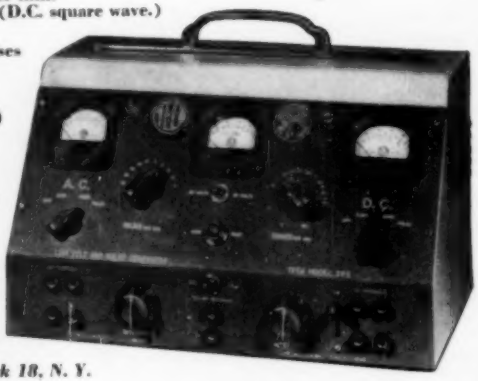

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